DOCUMENT RESUME

ED 351 529 CE 062 343

AUTHOR	Faulkner, Susan L.; And Others
TITLE	Community College Professional Development: Sharing What Works. Proceedings of a National Conference (San Antonio, Texas, October 18-19, 1991).
INSTITUTION	National Center for Research in Vocational Education, Berkeley, CA.
SPONS AGENCY	Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE	Oct 92
CONTRACT	V051A80004-91A
NOTE	286p.; A Technical Assistance Report.
AVAILABLE FROM	National Center for Research in Vocational Education, Materials Distribution Service, Horrabin Hall 46, Western Illinois University, Macomb, IL 61455 (order no. MDS-296: $12.95).
PUB TYPE	Collected Works - Conference Proceedings (021) -- Reports - Research/Technical (143) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC12 Plus Postage.
DESCRIPTORS	Academic Education; *College Faculty; Community Colleges; Computer Uses in Education; *Curriculum Development; Demonstration Programs; Disabilities; *Faculty Development; Faculty Evaluation; High Risk Students; *Integrated Curriculum; Models; School Holding Power; Student Recruitment; *Technical Education; Two Year Colleges; Vocational Education; *Vocational Education Teachers
IDENTIFIERS	*Tech Prep

ABSTRACT

This document contains 30 papers on professional development in community colleges. The following papers are included: "Effective Leadership Strategies for Planning and Implementing Tech Prep" (Bragg, Huffman); "Small Business Management-Tech Prep" (Harvey); "Educational Reform and the New Mission" (Hoerner); "Tech Prep in Texas: An Implementation Strategy" (Nelson); "Tech Prep: An Integrated Curriculum" (Peters, Peters); "Educational Reform: A Broadening of Tech Prep" (Suksi); "The High Technology High School: A Campus-Based Collaborative Effort" (McAndrew et al.); "An Evaluation of the Outcomes of the Applied Mathematics Demonstration Sites in Indiana" (Pepple et al.); "Integration of Occupational and Academic Education: Illustrated Using Interior Design Vignettes" (Sepe et al.); "Human Resource Development for Higher Education and Industry" (Anderson et al.); "The Georgia Instructor Academy" (Askins, Galloy); "Evaluating Part-Time Faculty" (Brown); "Innovative Solution to an Educational Challenge (A Consortium Approach for Faculty Development)" (Carleton et al.); "The C-A-R Model: Linking Administrative Performance and Professional Development with Institutional Planning" (Drake); "Strategies and Resources for Part-Time Faculty Programming" (Fentiman); "The Preparation and Nurturing of Occupational Education Leaders" (Finch); "An Introduction to Teaching Consultation" (Kerwin, Rhoads); "Faculty Inservice: Alternative Strategies for Students with Disabilities" (Asselin, Dixon); "The Technology Intervention and Support Program" (Barton, Shively); "Interinstitutional Educational Alliances as an At-Risk Student Recruitment and Retention Strategy" (Bradley);

"Exemplary Vocational Education Programs Serving Postsecondary Special Needs Populations" (Maddy-Bernstein, Burac); "Creating a Special Place for Unique Students Today" (Rotkis, McDaniel); "Empowerment: The Link between Faculty Development and Curriculum Improvement" (Ball, Morrissey); "Using Instructor-Produced Videos to Teach an Open-Entry/Open-Exit Automotive Technology Program" (Clifford); "Juvenile Justice Computer Assisted Instructional Program" (Cordova, Fitzpatrick); "Pictures in the Head" (Crippens); "A Framework for Learning Advanced Vocational Skills" (Schell); and "Health Careers Opportunity Program: Summer Institute 1991" (Shields, Thompson). Seventeen brief roundtable papers are also included. (KC)

ED351529

NCRVE

National Center for Research in
Vocational Education

University of California, Berkeley

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it
☐ Minor changes have been made to improve reproduction quality
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

PROCEEDINGS FROM A NATIONAL CONFERENCE ON COMMUNITY COLLEGE PROFESSIONAL DEVELOPMENT: SHARING WHAT WORKS

Prepared by

Susan L. Faulkner, Lois A. Beeken, Liz A. Nay

In-Service Education Project
Virginia Polytechnic Institute and State University

National Center for Research in Vocational Education
University of California at Berkeley
1995 University Avenue, Suite 375
Berkeley, CA 94704

Supported by
The Office of Vocational and Adult Education,
U.S. Department of Education

October, 1992

MDS-296

This document is one in a continuing series of Technical Assistance Reports. It has not been reviewed by NCRVE; therefore, this paper represents the views of its authors and not necessarily those of the Center or the U.S. Department of Education. NCRVE makes these Technical Assistance Reports available upon request for informational purposes.

CE062343

BEST COPY AVAILABLE

FUNDING INFORMATION

Project Title: National Center for Research in Vocational Education

Grant Number: V051A80004-91A

Act under which Funds Administered: Carl D. Perkins Vocational Education Act
P. L. 98-524

Source of Grant: Office of Vocational and Adult Education
U.S. Department of Education
Washington, DC 20202

Grantee: The Regents of the University of California
National Center for Research in Vocational Education
1995 University Avenue, Suite 375
Berkeley, CA 94704

Director: Charles S. Benson

Percent of Total Grant Financed by Federal Money: 100%

Dollar Amount of Federal Funds for Grant: $5,918,000

Disclaimer: This publication was prepared pursuant to a grant with the Office of Vocational and Adult Education, U.S. Department of Education. Grantees undertaking such projects under government sponsorship are encouraged to express freely their judgement in professional and technical matters. Points of view of opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.

Discrimination: Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Title IX of the Education Amendments of 1972 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." Therefore, the National Center for Research in Vocational Education project, like every program or activity receiving financial assistance from the U.S. Department of Education, must be operated in compliance with these laws.

Special Note: The conference from which these proceedings evolved was a jointly sponsored effort of the National Center for Research in Vocational Education, the National Council for Occupational Education, the American Association of Community and Junior Colleges, the National Council of Instructional Administrators, and the Center for Occupational Research and Development.

TABLE OF CONTENTS

Preface i

Acknowledgments iii

Section I. Development and Implementation of Technical Preparation (Tech Prep) Programs 1

Effective Leadership Strategies for Planning and Implementing Tech Prep

Debra D. Bragg and Glenda K. Huffman 3

Small Business Management-Tech Prep

Helen M. Harvey 15

Educational Reform and the New Mission

James L. Hoerner... 21

The Development and Implementation of a Tech Prep Program Designed to Integrate Academic and Vocational Education in the Feeder High Schools of a Community College District

Paul McInturff 29

Tech Prep in Texas: An Implementation Strategy

Carrie Hughes Nelson 33

Tech Prep: An Integrated Curriculum

Till J. N. Peters and Linda S. Peters 43

Educational Reform: A Broadening of Tech Prep

James Suksi 53

Section II. Integration of Occupational and Academic Education........................ 63

The High Technology High School: A Campus-Based Collaborative Effort

Brian McAndrew, Thomas Bistocchi, and Gregory DeCinque 65

An Evaluation of the Outcomes of the Applied Mathematics Demonstration Sites in Indiana

Jerry Pepple, Steve Tozer, and Frank O'Connor 71

Integration of Occupational and Academic Education: Illustrated Using Interior Design Vignettes

Thomas D. Sepe, Dorothy Miller, and Margaret Wylie.................... 87

Section III. Professional Development of Occupational/Technical Faculty 95

Human Resource Development for Higher Education and Industry

Lowell D. Anderson, Robert E. Croker, and Ivan V. Simmons 97

The Georgia Instructor Academy

K. Brent Askins and Michael J. Galloy 105

Evaluating Part-Time Faculty

Corrine M. Brown 115

Innovative Solution to an Educational Challenge (A Consortium Approach for Faculty Development)

Midge Carleton, Fernon P. Feenstra, Candis M. Martin, and Lawrence E. Ordowski 121

The C-A-R Model: Linking Administrative Performance and Professional Development with Institutional Planning

James A. Drake 127

Strategies and Resources for Part-Time Faculty Programming

Dee A. Fentiman 135

The Preparation and Nurturing of Occupational Education Leaders

Curtis R. Finch 139

An Introduction to Teaching Consultation

Michael Kerwin and Judith Rhoads 147

Section IV. Strategies for Teaching At-Risk Youth and Adults in the 1990s 155

Faculty Inservice: Alternative Strategies for Students with Disabilities

Susan B. Asselin and Jeananne Dixon 157

The Technology Intervention and Support Program

Shirley Barton and Elaine Shively 165

Interinstitutional Educational Alliances as an At-Risk Student Recruitment and Retention Strategy

John L. Bradley 171

Exemplary Vocational Education Programs Serving Postsecondary Special Needs Populations

Carolyn Maddy-Bernstein and Zipura T. Burac 187

Creating a Special Place for Unique Students Today

Judy Rotkis and Nancy McDaniel 195

Section V. Miscellaneous Topics 201

Empowerment: The Link Between Faculty Development and Curriculum Improvement

Peggy Ball and Sharon Morrissey 203

Using Instructor-Produced Videos To Teach an Open-Entry/Open-Exit Automotive Technology Program

John J. Clifford 211

Juvenile Justice Computer Assisted Instructional Program

Arthur B. Cordova and Brian Fitzpatrick 217

Pictures in the Head, Keynote Luncheon Speech

David L. Crippens 225

A Framework for Learning Advanced Vocational Skills

John W. Schell.. 233

Health Careers Opportunity Program: Summer Institute 1991

Linda Shields and Margaret Thompson 245

Developing Faculty Course Planning Skills With an Artificial Intelligence Software Package: The Secrets Behind an Expert System

Daniel E. Vogler and Thomas Leitzel 251

Section VI. Roundtables 259

How To Spell Vocational Education with Three "Rs": Integration of Occupational and Academic Education

Ethan Allen and Gloria Garner 261

The Integrated Thinking Skills Project: Teaching Teachers To Teach Thinking

Diane D. Cheatwood 263

Teaching with the Fourth "R": Integration of Occupational and Academic Education and Development of Occupational/Technical Faculty

Robert S. Clark and Mary E. Myers 265

Integration of Academic and Occupational Education at Eastern Idaho Technical College: A Practical Application

Kenneth Erickson.. 267

Inservice Education Needs of Part-Time Business Faculty

Susan L. Faulkner 269

Institute for Professional Development of Part-Time Occupational Instructors

David L. Goetsch 271

Training for the Development of Tech Prep

Robert C. Harris 275

Identification and Dissemination of Articulated Tech Prep: Practices for At-Risk Students

James L. Hoerner, Darrel A. Clowes, and James C. Impara 279

Strategic Planning: Charting the Course

Linda Luehrs 281

American Colleges and Universities Offering Coursework on Two-Year Institutions: Results of a National Survey

D. Barry Lumsden and G. Bryan Stewart 283

The National Network for Curriculum Coordination in Vocational and Technical Education: The Network That Works

Richard C. Makin 287

Faculty Development Strategies for Meeting the Needs of Senior and Novice Occupational Faculty

Elaine Mohn 291

Tech Prep in Texas: An Implementation Strategy

Carrie Hughes Nelson 293

Teaching for Success: A Fresh Approach to Part-Time Faculty Development

Jack H. Shrawder 295

Job Search Techniques: A Required Course for the Associate Degree

Merilynne Smith 297

Relevancy in the Classroom: Using Current Media To Teach Reading, Writing, and Critical Thinking

Merilynne Smith 299

PREFACE

On October 18 and 19, 1991, the National Center for Research in Vocational Education (NCRVE), University of California at Berkeley, conducted an on-site national conference entitled "Community College Professional Development: Sharing What Works." The conference was cosponsored by the National Council for Occupational Education (NCOE), the American Association of Community and Junior Colleges, the National Council of Instructional Administrators, and the Center for Occupational Research and Development. It was held prior to the seventeenth annual conference of the National Council for Occupational Education at the Holiday Inn-Riverwalk in San Antonio, Texas.

The objectives of the conference were to focus on innovative approaches to designing, implementing, and evaluating effective professional development programs and to share outcomes from research projects relating to technical, junior, and community colleges.

The 125 conference participants represented educators and policymakers from twenty-four states. Participants were administrators and faculty from technical, junior, and community colleges as well as representatives of public secondary schools, national professional development organizations, state departments of community colleges, higher education coordinating boards, and private consulting agencies. Representatives from twelve universities were also participants or speakers.

Keynote speakers for the conference were James L. Hoerner, NCRVE researcher; Gerald Hayward, NCRVE Deputy Director; and David L. Crippens, Senior Vice President, Educational Enterprises, KCET, Channel 28, Los Angeles.

A total of thirty-two papers were presented at the conference. Thirty of the papers (included in this monograph) were divided into five areas: (1) Development and Implementation of Technical Preparation (Tech Prep) Programs, (2) Integration of Academic and Vocational Education, (3) Professional Development of Occupational/Technical Faculty, (4) Strategies for Teaching At-Risk Youth and Adults in the 1990s, and (5) Miscellaneous.

In addition, seventeen roundtable sessions were provided for participants. Roundtable discussions provided practitioners with an opportunity to more informally discuss specific strategies for professional development. Mini papers, also included in this monograph, served as discussion starters for the roundtable sessions.

Overall, the conference was well-received by the attendees. Evaluations indicated that the information provided was both relevant and well presented. The information provided practical examples that could be incorporated at postsecondary institutions.

Susan L. Faulkner, Ed.D.
Research Associate
Inservice Education Project, NCRVE

ACKNOWLEDGMENTS

Above all, we wish to thank the many professionals who made presentations at the conference and submitted papers for this monograph and those 125 individuals who attended the conference. Discussions about innovative approaches to designing, implementing, and evaluating effective community college professional development programs and research outcomes relating to community colleges contributed greatly to the success of the conference.

We would also like to thank Margaret Isom of Virginia Tech, Ellen Agee of Virginia Tech, and Jeananne Dixon of New River Community College for the many hours they devoted to planning and organizing the conference and to Janet Rakes for her assistance in organizing and typing the monograph. Homer Hayes at San Antonio Community College was especially helpful in providing audiovisual equipment for the presentations and extra personnel to work the registration desk. We also wish to thank Raul Rameriz of El Paso Community College for helping us coordinate the conference with the National Council for Occupational Education Conference.

SECTION I
DEVELOPMENT AND IMPLEMENTATION OF TECHNICAL PREPARATION (TECH PREP) PROGRAMS

EFFECTIVE LEADERSHIP STRATEGIES FOR PLANNING AND IMPLEMENTING TECH PREP

Debra D. Bragg
Glenda K. Huffman
University of Illinois at Urbana-Champaign

An innovative approach to education called Technical Preparation (Tech Prep) was authorized by the Carl D. Perkins Vocational and Applied Technology Education Act of 1990. In response, state educational agencies, community colleges, secondary schools, business and industry leaders, and other organizations are forming partnerships to ensure that Tech Prep initiatives develop successfully. The evolving focus of Tech Prep places it in a pivotal position for reforming education at the secondary and postsecondary education levels and possibly at the elementary level. The Illinois State Board of Education (1991) describes Tech Prep as an educational path that integrates technical and academic content through an articulated sequence of courses from the secondary level to the postsecondary level leading to a two-year degree. Nationwide, Tech Prep is viewed as an opportunity to bring work-relevant content into education. Tech Prep is described as an opportunity to improve education across all disciplines and levels.

As Tech Prep evolves, there is a growing need to understand various approaches to planning and implementation. Increasingly, we learn of effective approaches (Fullan, 1991; Odden, 1991). What lessons can educational leaders take from these reform efforts? What unique lessons can be learned from educators involved in planning and implementing Tech Prep? This paper is designed to address these questions by describing planning and implementation strategies used in establishing Tech Prep initiatives. While it is much too early to declare any strategies successful, it is possible to share what those involved in initiating Tech Prep perceive to be successful in accomplishing state and local goals.

OBJECTIVES

The primary goal of this paper is to describe the strategies employed by certain educational leaders, most of whom work in postsecondary settings, planning and implementing Tech Prep. With respect to this goal, the following issues will be discussed:

(1) critical phases of planning; (2) selected planning strategies; (3) strategies for overcoming barriers to planning and implementation; and (4) apparently crucial leadership skills, knowledge, and attributes.

PERSPECTIVES AND METHODS

Information presented in this paper is based on two descriptive research studies conducted to examine factors influencing planning and implementation of Tech Prep. The first study was conducted in a midwest state for all seventeen of its Tech Prep planning consortia sites during the 1990-1991 school year (Bragg, Huffman, Hamilton, & Hlavna, 1991). Multiple methods were used to collect data over a six-month time period, including the use of a two-page questionnaire to ascertain baseline planning information; one- or two-day site visits, observations, and personal interviews with individuals involved with ten consortia sites; and telephone interviews with project leaders of the remaining seven consortia sites. All instruments were pilot tested before being used. After each site visit or telephone interview, descriptive data was analyzed and preliminary findings were developed and sent to key respondents for verification. Finally, a one-page profile of critical planning and implementation strategies for each consortium site was developed with input from local project leaders.

The second study was a two-year, multiphased effort designed to foster better understanding of factors that influence Tech Prep planning and implementation at the state and local levels. An initial phase of the study involved telephone interviews and document analysis regarding planning strategies used by state agencies for implementation of the Tech Prep Education Act. These telephone interviews, averaging thirty to forty minutes, were conducted with the designated state leader for Tech Prep in all fifty states and the District of Columbia. Based on this information, a purposive sample of state and local educational organizations was identified for in-depth case studies to be conducted between October 1991 and March 1992. Information collected from state agencies regarding planning strategies used at both the state and local levels has been incorporated into this paper.

FINDINGS

The sequence of steps used in planning Tech Prep are typical of those used in planning almost any new educational initiative. Educators interviewed for this study were usually well versed in educational program development. Overall, they seemed cautiously enthusiastic about developing Tech Prep initiatives and involving key individuals representing the consortium partners and other stakeholders in the process. Because of the early stage in policy implementation, few interviewees had developed detailed plans for evaluation. However, many recognized the need to tie Tech Prep outcomes to federally mandated assessments and performance standards and discussed their intention to address evaluation more thoroughly in the future.

A consistent theme of the interviews was the importance of moving through the planning process at a pace that makes sense to local consortium partners. Decisions regarding where to start and how to progress through each Tech Prep initiative required input on local needs by those individuals involved in the planning process. Many interviewees discussed the planning phases as interrelated and ongoing, rather than discrete steps. They discussed strategies used to plan, develop, implement, and eventually evaluate Tech Prep (see Table 1).

Table 1
Tech Prep Planning Phases and Strategies

Phases	Planning Strategies
Planning	• Initiating the project • Involving consortia partners in planning • Developing a local philosophy • Selecting strategies and developing an overall philosophy • Developing an organizational structure • Developing and using planning teams • Devising and revising timelines
Development	• Developing local policies • Conducting staff development • Developing articulated and integrated curriculum • Writing articulation agreements • Providing guidance and counseling • Marketing • Ensuring meaningful collaboration with business/industry/labor
Implementation	• Initiating each component • Monitoring the initiative • Maintaining day-to-day processes and programs • Anticipating possible barriers • Overcoming barriers with problemsolving • Developing contingency plans
Evaluation	• Documenting and evaluating planning • Assessing learner outcomes • Determining the broader impact • Establishing ongoing, systematic evaluation processes • Ensuring continuous quality improvement • Ensuring the use of evaluation results

Selected Tech Prep Planning Strategies

While it is too early to declare any planning practices exemplary, interviewees described a number of approaches as effective.

Strategies for Getting Started

Knowing exactly where to start planning a Tech Prep initiative was difficult. Many interviewees stated that they had so much to do in the first few months of the project that they felt overwhelmed. However, several individuals who had primary responsibility for leading a local Tech Prep initiative stated that they were able to move the planning process forward by undertaking the following steps: (1) gathering information to help educate themselves and their project staff, (2) gaining support from top leaders of the consortium by involving them in planning, (3) creating a local philosophy and planning approach, (4) involving individuals representing the consortium partners and other key groups in the planning, (5) creating an effective and efficient planning structure, (6) developing and involving planning teams in meaningful activities, and (7) setting realistic time lines.

Creating a Local Tech Prep Philosophy and Planning Approach

Several interviewees discussed the importance of adopting a local Tech Prep philosophy and clarifying the way federal and state definitions are to be used at the local level. These individuals frequently made statements such as "In our school, Tech Prep means . . ." or "We're a little different from the rest: We think about Tech Prep as. . . ." These individuals had thought strategically about the purpose of Tech Prep and about the ways it could be used to improve educational opportunities for students in their institutions. By making their goals explicit, interviewees were able to provide direction for their projects. When the local philosophy was developed collaboratively with other consortium partners, there seemed to be greater commitment to Tech Prep and to conducting a systematic planning approach for it. Some important questions interviewees asked in formulating a local Tech Prep philosophy included

1. What is the purpose of the local Tech Prep initiative?
2. Who should participate in the initiative?
3. How will we know when it is working?
4. What outcomes are expected of students with different ability levels, career aspirations, and personal needs?

Recruiting Key Groups To Participate in Planning

According to interviewees, inviting the participation of stakeholder groups with a keen interest in the development and implementation of Tech Prep had several benefits. Involvement of groups resulted in shared ownership in Tech Prep, potentially improving effectiveness. Interviewees also stated that increased involvement helped prepare people for change, an inevitable consequence of Tech Prep.

Knowing which stakeholders to involve in planning was not always simple in early stages. Interviewees advised that it was important to select those individuals, groups, and organizations that were directly impacted by Tech Prep and likely to be interested in ensuring its success. This meant identifying (1) educational institutions as partners in secondary/postsecondary articulation; (2) employers as partners with education in designing work-based learning to provide viable work experiences and job placements; (3) technical and academic program areas that could be integrated into a meaningful and practical curriculum; (4) individuals—including community leaders, board members, and parents—who could be champions for Tech Prep and lead local planning activities; (5) educators at all levels who offered enthusiasm and energy for developing Tech Prep; and (6) students and parents who could benefit from the programs.

Developing Tech Prep Planning Teams

Much could be done to build a healthy working environment for planning teams, according to interviewees. Seven strategies were identified: (1) gain commitment and needed resources from top leaders to carry out a team planning approach, (2) formalize the team planning agenda and procedures, (3) conduct or obtain training in team planning, (4) provide ample opportunity to practice team planning, (5) observe other Tech Prep planning teams in action, (6) monitor planning and intervene when teams are not productive, and (7) celebrate accomplishments at milestones in the project.

Strategies for Overcoming Barriers

The successful implementation of the proper strategies and resources ensured that Tech Prep functioned effectively. Several interviewees shared information about potential barriers they had encountered. Many of these observations focused on the inevitable dilemma associated with resistance to change. Several barriers were identified by more than one interviewee, and implementation strategies were recommended for overcoming those barriers (see Table 2).

Table 2
Potential Tech Prep Barriers and Implementation Strategies

Barrier	Implementation Strategies
Lack of focus	• Communicate a vision clearly, honestly, and enthusiastically • State the benefits to all key groups • Know the territory • Plan from a solid conceptual base • Build and maintain relationships with constituencies
Lack of commitment to Tech Prep	• Explain and sell the concept repeatedly • Build support among respected leaders • Involve key stakeholders • Listen and share • Empower people through team building and staff development • Celebrate milestones (e.g., first class days and graduations) • Develop strategies for handling opponents
Fear of losing vocational education programs and students	• Allow time for roles, policies, and attitudes to adjust • Expect some conflict • Allow time for team building • Monitor enrollments and course-taking patterns
Lack of clear implementation strategies	• Distribute a written action plan • Specify what, why, who, and when in the implementation plans • Determine needed supplies, equipment, and other resources • Anticipate possible problems • Make contingency plans • Implement gradually • Be willing to fine tune and refocus
Communication problems	• Develop mechanisms for sharing accurate and consistent information • Share progress reports regularly • Schedule staff development regularly • Schedule group discussions regularly • Assign a person to troubleshoot problems • Build in procedures to handle problems • Intervene in serious problems • Provide joint planning time for instructors

Table 2 (continued)

Barrier	Implementation Strategies
Lack of resources (time, people, materials)	• Outline resource needs early • Delegate duties • Set priorities • Start one program at a time • Use existing services, people, and materials • Solicit funding from business/industry, government, or others
Difficulties articulating in large diverse areas	• Schedule centralized staff development for team leaders who, in turn, train local planners • Use site-based planning teams • Maximize input from local planners • Ensure review and feedback as initiatives are developed
Lack of credibility	• Allow time for Tech Prep to become established • Demonstrate top-leader commitment • Publicize benefits • Carefully market the initiative • Assist students with support services to ensure their success

Leading the Tech Prep Initiative

The job of managing a local Tech Prep initiative was very complex. Sometimes this job was shared by members of a project leadership team, but more often it was undertaken by one individual. Interviewees who were project leaders shared their perceptions about skills and knowledge required for success. In addition, others involved in Tech Prep planning were asked their impressions of the skills and knowledge required to undertake the job of Tech Prep project leader. First and foremost, interviewees described the importance of having expertise in education, especially in the following areas: (1) curriculum development, (2) program planning and evaluation, (3) marketing and student recruitment, (4) specific school and college systems, (5) state and local educational systems, (6) vocational and technical education, (7) secondary/postsecondary education articulation processes, and (8) academic and technical education integration concepts. Interviewees stated that Tech Prep project leaders must also possess skills and knowledge in the processes of leading and managing an educational innovation project. Three project leader roles, along with multiple responsibilities for each of the roles, emerged from the interviews (see Table 3).

Table 3
Roles and Responsibilities of Tech Prep Project Leaders

Role	Responsibilities
Change Leader	• Initiate start-up • Recruit key groups • Instill enthusiasm and commitment • Stimulate the planning process • Create and recommend alternative approaches
Facilitator	• Search for and interpret information • Educate others about planning • Organize and guide planning teams • Help groups develop positively • Establish a climate of trust • Resolve conflicts • Link people with information and resources • Keep teams moving • Communicate (both verbally and in writing) and listen carefully • Give formal and informal presentations • Disseminate information about the project • Conduct follow-up visits with participating sites
Manager	• Organize and coordinate planning meetings • Coordinate data collection and analysis • Select, orient, and supervise project staff • Acquire resources and manage budgets • Maintain project records • Conduct grant writing • Juggle multiple management responsibilities

SUMMARY

This paper has focused on the planning strategies used by educators to initiate new Tech Prep initiatives. Research conducted on factors influencing Tech Prep planning and implementation in the Midwest and nationwide reveals useful information about how leaders can approach Tech Prep program development. These findings indicate that specific planning strategies can be employed that maximize the accomplishment of program goals. These strategies include gaining top leader support, developing a local philosophy, recruiting stakeholders to participate in planning, and organizing a team planning approach. The challenge we faced was determining the extent to which Tech Prep stimulates educational reform across the board and results in a truly integrated and life-centered approach to education. Without a doubt, Tech Prep represents one of education's greatest leadership challenges.

REFERENCES

Bragg, D., Huffman, G., Hamilton, L., & Hlavna, L. (1991). *Illinois Tech Prep planning strategies*. Springfield: Illinois State Board of Education.

Fullan, M. (1991). *The new meaning of educational change* (2nd ed.). New York, NY: Teachers College Press.

Illinois State Board of Education. (1991). *Request for vocational education proposals: Tech Prep programs*. Springfield: Author.

Odden, A. R. (Ed.). (1991). *Educational policy implementation*. Albany: State University of New York Press.

SMALL BUSINESS MANAGEMENT-TECH PREP

Helen M. Harvey
Division of Technologies
New River Community College

INTRODUCTION

The general objective of the New River Community College (NRCC) Small Business Management-Tech Prep program is to create an applied curriculum for students with entrepreneurial interests that would chart their educational course from the ninth grade through a baccalaureate degree. The expected result of the program is to provide the New River Valley with comprehensively trained entrepreneurs who can be successful in small business.

PROJECT BACKGROUND

The development of the Tech Prep concept in Virginia has been closely tied to the theme of economic development. In 1988, Hockaday, Chancellor of the Virginia Community College System (VCCS), appointed a sixteen-member task force to study the status of economic development in Virginia and determine what role the VCCS should assume in promoting and sustaining economic growth in the state. The resulting thirty-page document, published as *Challenges Toward the Year 2000,* contained many specific conclusions, but the following statement has been crucial to the development of the small business management program for which New River has received grant funding:

> State and local officials, corporate and community leaders, and the general public comprehend the growing importance of technology, education, information to job formation, increased productivity, and economic development in Virginia. They depend on Virginia's community colleges to provide foundation and technical skills for the growing number of occupations that require far more than the basics but less than a baccalaureate. More and more, they are also depending on community colleges for ongoing training and for technical assistance to small businesses. As a result, the community college is emerging in Virginia as the educational institution best suited to bridge the gaps between theory, practice, research, commerce, and productivity. (Virginia Community College System [VCCS], 1989, p. 6)

VCCS (1989) additionally concluded that "Virginia's community colleges face the challenge of intensifying direct support for small business development with the local community and for the positioning of small businesses and emerging entrepreneurs to survive and prosper" (p. 20).

Based upon their findings and upon the knowledge that approximately eighty-five percent of the economy in the New River Valley is driven by small business enterprises, NRCC began to search for innovative ways to promote small business management endeavors. As a result, a triple venture in Tech Prep began. Participants in the consortium were the five New River Valley public school divisions, New River Community College, and Virginia Polytechnic Institute and State University (Virginia Tech).

PROJECT GOAL

The basic goal of the consortium is to provide the opportunity for students to enroll in technical courses and simultaneously achieve small business management competencies. The Small Business Management-Tech Prep program specifically provides students in grades nine through twelve with an avenue for learning technical skills and business applications. Upon graduation from high school, Tech Prep students have the option of continuing their education in an articulated program at the community college. NRCC students have the choice of continuing their high school major in a technical curriculum and taking specified electives in business management or majoring in business management and taking specified electives in their technical field. Upon graduation from the community college with an Associate in Applied Science degree, students may obtain employment or continue their education in the Division of Vocational and Technical Education at Virginia Tech. The resulting baccalaureate degree gives students the credentials to find employment in the area of small business management, start their own businesses, teach vocational or business education, or become an industrial trainer.

PROJECT OBJECTIVES

The Small Business Management-Tech Prep program is designed to achieve the following seven objectives: (1) develop an innovative Tech Prep program for small business management that would serve as a model for the state and the nation; (2) develop a model articulated curriculum for regional high schools, the community college, and the university for a small business management program; (3) prepare a curriculum guide for an articulated small business management program at the secondary and postsecondary levels; (4) establish an administrative organization to conduct the project, an organization that includes collaboration with business, industry, government, and educators in the New River Valley region of Virginia; (5) provide an inservice education program for teachers, counselors, and administrators participating in the project; (6) organize a public information program to disseminate information about the program to students, parents, educational personnel, business, industry, civic, and governmental agencies; and (7) develop criteria, procedures, and evaluation instruments for the program.

ORGANIZATIONAL STRUCTURE

An extensive administrative organization is established to facilitate the planning and development stages of the project. The administrative structure includes the establishment of an administrative board, a coordinating committee, and a resource/advisory committee. The administrative board consists of the president of NRCC and the superintendents of the five public school systems that serve the valley. The president of NRCC chairs the board and is responsible for directing the administration of the project.

The Coordinating Committee consists of the chairperson of the Division of Technologies at the community college who serves as the project director; the directors of vocational education within each of the five local public school divisions, one director of whom serves as an associate director; and two representatives selected from Virginia Tech, one of whom serves as an associate director. The Coordinating Committee is responsible for planning, implementing, and evaluating activities for the project.

The Resource/Advisory Committee is composed of representatives from each of the Chambers of Commerce in the New River Valley, the Director of the Small Business

Institute at Virginia Tech, a guidance counselor from one of the high schools, the cluster leader of the business management program at the community college, and the chair of a business education department in one of the participating high schools. The Resource/Advisory Committee identifies and verifies the competencies needed for small business management and determines how to infuse the competencies into existing courses or new courses. Additionally, the committee develops strategies for student recruitment and counselor and teacher development.

INSERVICE EDUCATION

Inservice education/professional development is necessary to prepare instructors at both the regional high schools and the community college for implementing the program. The inservice training consists of (1) briefings for administrative officers in each secondary school system and in both the community college and university; (2) meetings to inform all participants, including students, about the program; (3) summer institutes for faculty members to develop applied teaching skills; and (4) workshops to assist faculty members in developing applied courses and in evaluating program outcomes.

CONCLUSION

The following quotation from the *Tech Prep Education Program for Virginia* (New River Community College-Technologies Division, 1991) succinctly expresses all that is to be accomplished through Tech Prep programs:

> Considering recent economic forecasts, it should not be surprising that small business management and entrepreneurship education is receiving so much attention. Colleges are developing courses and programs to train entrepreneurs; furthermore, they are recognizing the need to work in close partnership with public education systems to infuse entrepreneurship education into the elementary, middle, and secondary levels. Although research shows that most entrepreneurial ventures of substantial scope are undertaken after the age of twenty-five, entrepreneurship instruction that begins earlier can stimulate students to consider business ownership or entrepreneurship as a career alternative. (p. 21)

REFERENCES

New River Community College, Technologies Division. (1991). *Tech Prep educational program for Virginia: A small business management entrepreneurship Tech Prep program.* Dublin, VA: Author.

Virginia Community College System (VCCS). (1989). *Challenges toward the year 2000: A report to the chancellor's task force on the role of the Virginia community college system in economic development.* Richmond: Author.

EDUCATIONAL REFORM AND THE NEW MISSION

James L. Hoerner
Virginia Polytechnic Institute and State University

With the present emphasis on reform throughout the educational system, educators at all levels must respond. President Bush is given credit for having said, "The days of the status quo are over" (*America 2000:*, 1991, p. 2); educators can no longer leave things as they are. While I hope educators are not choosing to make things worse, I do believe that by perpetuating the status quo in education, we are making things worse.

Educators only have one choice, and that is to make things better. If educators pay attention to reports like *America 2000: An Educational Strategy Sourcebook* (1991), and The Secretary's Commission on Achieving Necessary Skills (SCANS) report (1991) and to what Secretary of Labor Martin and Secretary of Education Alexander have to say, they realize that "we are talking about a revolution in education" (*America 2000*, 1991).

This paper is about the reform and the new mission that is part of the revolution. The necessary reform and new mission have implications for all levels of education, including elementary, secondary, community colleges, and universities. The success of this nation's educational system rests firmly on educators' rethinking the educational process, making a number of mindset changes, and accepting a new mission for education.

Study after study during the past several years has addressed the need for educational reform, yet educators generally seem to be oblivious to such studies. I wonder how many educators at any level—elementary, secondary, community college, or university—have participated during the last six months in a planned forum to discuss implications of such studies as *America's Choice* (Commission on the Skills of the American Workforce, 1990), *Workplace Basics* (Carnevale, Gainer, & Meltzer, 1990), *America 2000* (1991), *What Work Requires of Schools: A SCANS Report for America 2000* (SCANS, 1991). I believe educators seldom stop and take time to reflect on what such studies are saying to us. Educators seem by nature to resist change.

Fiske (1991) in *Smart Schools, Smart Kids* states that if we are going to reform education, we should start by rethinking education and developing a new *vision* of what education should be. The educational reform that is being discussed in many documents and studies will be effective only if educators start rethinking the basic philosophy of education and make a number of mindset changes. We can change structure, increase requirements proposed in *America 2000* (1991), and lengthen the school year; but if educators do not change how they view the educational process, little improvement will take place.

The first mindset change that must take place is for educators to stop practicing and conducting education as if there were two worlds—education and work. Wirtz, former U.S. Secretary of Labor, perhaps summed it up best when he said, "There aren't two worlds—education and work—there is one world—life. Learning by hands-on participation . . . should be at the heart of our education perspective" (William T. Grant Foundation, 1988, p. 3). Educators have sustained the myth that education takes place in one setting and later there is another setting called the world of work. Too often we are not interested in the relationship between the two. After all, our present educational system was founded on the British elitist model in which education generally was not intended to be applicable to work. Until this first mindset change is made, educators will continue to practice a separatism of education and work.

A second mindset change is expressed by Brand, U.S. Assistant Secretary for Vocational Education, who in a discussion with a committee of technical educators in her office stated, "We need a mind-set change among educators at all levels regarding their role in human resource development" (personal communication, January 22, 1990). Human resource development has tended to be viewed as a corporate term. Educators do not seem to view themselves as human resource developers. Yet I ask, what is their business if it is not human resource development? Surely, no educator today would answer "to disseminate knowledge" even though such an answer indicates how many seem to practice. Most educators tend to see themselves as math teachers, history teachers, science teachers, and electronics teachers just as I did in 1963 when I taught high school algebra in San Jose, California. The focus continues to be teaching a subject and not students. Can you imagine the difference it would make if administrators and teachers said that the theme in their school is human resource development for every student?

Many studies have discussed the role of education in human resource development. *Workforce 2000* (Johnston & Packer, 1987) set the stage with the statement that "education and training are the primary systems by which this human capital of a nation is preserved and increased" (p. xxvii). A second document that seemed to escape most educator's attention, *Building a Quality Workforce* (McLaughlin, Bennett, & Verity, 1988), added to the responsibility of education for human resource development when it said, "Education has the responsibility for initially preparing the entry level workforce" (p. 2). The document did not say that education had the responsibility to prepare *only* the top twenty to thirty percent of the workforce. This was perhaps the first time this charge to education was ever put in print. A third study, *The Forgotten Half: Pathways to Success for America's Youth and Young Families*, further set this responsibility: "Education and training remain the forgotten half's most fundamental and reliable pathways to success" (William T. Grant Foundation, 1988, p. 127). *America's Choice: High Skills or Low Wages!* also supports the role education must play in human resource development: "Guaranteeing the right to a good education to every young American and providing positive links between educational achievement and jobs are essential to the creation of an educated nation" (Commission on Skills of the American Workforce, 1990, p. 72). Fiske (1991) in *Smart Schools, Smart Kids* further alluded to this responsibility when he said, "The consequences of becoming a learning society are enormous, for it means that for the first time schools have been given the job of producing the 'capital' on which the country depends" (p. 23).

All of these studies, as well as many others, point out that education must play a major role today and in the future in preparing the quality workforce this nation needs. Such preparation requires reform that will happen only when educators make the necessary philosophical mindset change regarding their responsibility in human resource development.

A third necessary mindset change is for education to stop practicing the theme of "sort out the best and forget the rest" (Hart, 1989). Education has used for too long a sorting process that is detrimental to many youth. This nation can no longer afford to develop only the most academically capable. All of our human capital must be developed to its fullest potential. The elitist sorting process no longer belongs in education. Educators would do well to get rid of the term "academics." One of Webster's definitions of academic is "having no practical or useful significance" (Mish, 1976, p. 6). While *America 2000* (1991) and the first part of Goal 3 of its six national education goals focuses on improving the academic achievement of our youth in English, math, science, history, and geography, this expanded emphasis could be suspect if it is without practical application.

The fourth mindset change invades a new mission for education, and it is found in Goal 3 of the six national goals for education. Goal 3 states that "By the year 2000 . . . every school in America will ensure that all students . . . be prepared for responsible citizenship, further learning, and productive employment" (*America 2000*, 1991, p. 62). While some say that Goal 3 is about academic achievement, I believe that the first part of the goal applies to vocational education, as well, because it deals with citizenship, further education, and productive employment. Being academically prepared but not employable does not do an individual or the nation any good.

The new mission then is to provide an educational system in which *all* students are prepared for further learning and productive employment. Educators, of course, have been preparing four-year college bound students. After all, the purpose of a four-year university is essentially to prepare the students for further learning and ultimately to prepare them for employment. We are now saying that we need an educational system that sees its mission as doing this for all students, especially since this nation believes in life-long learning, and we continue to be a work-oriented society. The Los Angeles public school system has just announced that by 1994 they will guarantee that all high school graduates will be prepared for further learning or productive employment. This new mission requires a major shift in mindset for most teachers, counselors, and administrators in most educational settings, from elementary schools through universities. It especially impacts colleges that teach education—the makers of educators—in the charge they give future teachers, counselors, and administrators who exit their doors. Imagine an educational system in which every institution sees its mission as developing all students to their fullest potential for further learning and productive employment. Hart (1989) and Fiske (1991) call such schools success-oriented. This reorientation of our educational system requires a true philosophical change.

The fifth mindset change is that which perpetuates an educational system that assumes everyone should go to a four-year college. Study after study reflects that by the year 2000, seventy percent of the jobs in America will not require a four-year college education (Commission on the Skills of the America Workforce, 1990). Yet, most educators—counselors, teachers, and administrators—continue to put most of their emphasis on the college bound. High schools continue to use as criterion of success the percentage of students who go to college. What they don't report is what percentage complete a bachelors degree and, even more revealing, what percentage assumed jobs that required a four-year degree. It is time we shift the emphasis away from the college bound and toward providing a system that the majority of the students need.

The sixth mindset reform that must be made is in the area of educational processes or teaching strategies—how teachers teach. Most teachers still teach in the abstract instead of in an applied mode or work-based approach. Educators must begin to see the need for relevant, applied learning. Perhaps an old Chinese proverb best tells us why we need learning taught in the applied mode: "I hear and I forget, I see and I remember, I do and I understand."

Many studies have emphasized the need for a shift to the applied, work-based learning mode. *The Forgotten Half* states, "Learning takes place when learners regard what one needs to know as relevant to their lives" (William T. Grant Foundation, 1988, p. 128). Writings in *America's Choice* also support the importance of relevancy: "The lack of any clear direct connection between education and employment opportunities for most young people is one of the most devastating aspects of the existing system" (Commission on the Skills of the American Workforce, 1990, p. 72). In *Work-based Learning: Training America's Workers*, Dole and Jones (1989) state, "Close linkages between school and work, through internship and apprenticeship types of programs, would substantially improve the career options of noncollege youth, raise the productivity of those with low academic skills, and give students genuine incentives to do well in school" (p. 5).

In another study, *What Work Requires of Schools: A SCANS Report for America 2000*, SCANS (1991) states that "all young Americans should leave school with the know-how they need to make their way in the world" (p. vi). This is a report that all educators need to consider. In the SCANS report, U.S. Secretary of Labor Martin calls this type of learning "contextual learning" and speaks of how schools must teach with work in mind: The "most effective way of learning skills is in context, placing learning objectives within a real environment rather than insisting that students first learn in the abstract what they will be expected to apply" (p. xv).

We need to stop and rethink the educational process and what our educational system should be doing today. It is time to have more in-depth and extensive inservice professional development. The "movers and shakers," decisionmakers, counselors, and all teachers—vocational and nonvocational—need to participate in forums, discuss the recent documents mentioned earlier, and rethink the mission of education.

In summary, this paper focused on six mindset changes or reforms that must take place if our educational system is going to provide the education that our youth need. We need to (1) stop practicing education as if it were separate from the world of work; (2) change the mindset about the role of education in human resource development; (3) stop "sorting out the best and forgetting the rest"; (4) adopt the mission that *all* students are to be prepared for further learning and productive employment; (5) stop perpetuating a system that advocates that everyone should go to a four-year college or university; and (6) initiate applied, work-based strategies for learning. The real challenge that education faces is to adopt a system in which the permeating climate throughout every level is one of success-oriented education for all.

REFERENCES

America 2000: An educational strategy sourcebook. (1991). Washington, DC: U.S. Department of Education.

Carnevale, A. P., Gainer, L. J., & Meltzer, A. S. (1990). *Workplace basics: The skills employers want.* Alexandria, VA: American Society for Training and Development.

Commission on the Skills of the American Workforce. (1990). *America's choice: High skills or low wages!* Rochester, NY: National Center on Education and the Economy.

Dole, E., & Jones, R. T. (1989). *Work-based learning: Training America's workers.* Washington, DC: U.S. Department of Labor.

Fiske, E. B. (1991). *Smart schools, smart kids.* New York, NY: Simon & Schuster.

Hart, L. A. (1989). The horse is dead. *Phi Delta Kappan, 71*(3), 237-242.

Johnston, W. B., & Packer, A. H. (1987). *Workforce 2000.* Indianapolis, IN: Hudson Institute.

McLaughlin, A., Bennett, W., & Verity, C. W. (1988). *Building a quality workforce.* Washington, DC: U.S. Department of Labor.

Mish, F. C. (Ed.). (1976). *Webster's new collegiate dictionary.* Springfield, MA: Merriam.

Secretary's Commission on Achieving Necessary Skills (SCANS). (1991). *What work requires of schools: A SCANS report for America 2000.* Washington, DC: U.S. Department of Labor.

William T. Grant Foundation Commission on Work, Family, and Citizenship. (1988). *The forgotten half: Pathways to success for America's youth and young families.* Washington, DC: Author.

THE DEVELOPMENT AND IMPLEMENTATION OF A TECH PREP PROGRAM DESIGNED TO INTEGRATE ACADEMIC AND VOCATIONAL EDUCATION IN THE FEEDER HIGH SCHOOLS OF A COMMUNITY COLLEGE DISTRICT

Paul McInturff
John A. Logan College

INTRODUCTION

The Tech Prep initiative at John A. Logan College and its delivery systems have focused on establishing cooperative efforts between vocational and academic teachers to enhance educational offerings for students. Tech Prep teams have been formed and consist of administrators, guidance counselors, and high school teachers from the vocational, mathematics, science, and communications areas. The goal of each team is to successfully implement Tech Prep at each participating high school and at the community college.

OBJECTIVES

Three objectives exist for the program: (1) to plan for increased articulation among secondary schools, the community college, and the university technical areas; (2) to develop a "4+2" or "4+2+2" Tech Prep planning document; and (3) to provide opportunities to plan together for the implementation of Tech Prep programming throughout the John A. Logan College district of twelve feeder high schools, John A. Logan College, and Southern Illinois University at Carbondale (SIU-C).

OVERVIEW

The concern that initiated the project stemmed from the quality of students that the college had been receiving from the high schools. It seemed that in recent years two things were happening. The college was not receiving high-quality students as in the past, and advancements in technology had changed many of the traditional vocational-technical programs to more sophisticated programs that required additional math, communications, and related science skills from entering freshmen.

For the community college to graduate vocational-technical students who would be capable of holding a technical job and who would have the necessary skills and knowledge to advance and adapt on that job, it needed high school students who were better prepared. The administration realized that the college could not merely impose stricter entry requirements. Instead, it was determined that the college would have to help the feeder high schools enrich and upgrade their present programs. With the community college helping, the high schools would graduate students better prepared to enter programs at the college.

The chair of the Business and Industry Division at the college visited areas where curricular upgrades had been accomplished and conducted extensive research in order to determine the proper procedures to follow. At the same time, the State of Illinois mandated that Tech Prep would be a priority throughout the educational system. Grants of approximately $30,000 were given to several institutions for preliminary planning. These were distributed on a competitive basis. The grant for the college was written by the chair of Business and Industry Division in cooperation with two high school vocational leaders in the district.

The main purpose of the grant was to integrate applied teaching methods into traditional academic courses on the high school level (i.e., communications, math, and science). With the help of vocational leaders, high school teachers in each of the academic areas were chosen to serve on the committee. In addition, a vocational teacher was chosen to serve with the others as team leaders. The four team leaders were chosen because they were creative, respected, proven leaders in their fields. The seven members of the committee, along with other grant recipients, attended a one-day training session that provided a basic understanding of Tech Prep.

The four team leaders, the two high school vocational leaders, and the community college chair began an educational process for others in the district. The groups who were the targets of this educational process were (1) academic teachers, (2) vocational-technical teachers, (3) administrators, (4) community college vocational-technical instructors,

(5) guidance counselors, and (6) representatives from business and industry. It was important to recognize that administrators and high school guidance counselors were very important groups in the educational process. Without the support of administrators and counselors, Tech Prep would have had little chance for success.

Administrators from four of the twelve high schools in the college district volunteered to participate in the pilot study. In addition to the primary team leaders who had already been chosen, a team was formed from each of the participating high schools consisting of an administrator; a guidance counselor; teachers from the academic areas of math, science, and communications; and a vocational teacher. A team leader was selected from each school's team.

An executive committee was also formed consisting of the community college vocational-technical dean; two high school education for employment officials; four team leaders from the specialty areas of vocational studies, math, science, and communications; and team leaders from the participating high schools. The executive committee, who had previously been oriented by the state office of education, developed a plan for implementing Tech Prep in the John A. Logan College District.

The committee decided that the delivery of additional education could best be accomplished by using the four team leaders from the specialty areas. This proved to be the proper choice. The high school teachers on the teams received the new information very well. Team members were released from their classes for these sessions and substitutes were provided for them. This cost was covered by the grant.

It was decided that specialists were required from the areas of mathematics, science, and communications to talk about their experiences with Tech Prep and the integration of vocational and academic studies. After the orientation and educational process was completed, the team began looking at programs and course syllabi for the high school instructors.

The team leaders from the specialty areas were given stipends to conduct research to determine the information available in each specialty area. Each specialty team leader was instructed to choose ten to fifteen topic areas and develop a representative teaching plan that illustrated how an applied teaching method could be integrated into the corresponding academic course. These plans were then presented to the team members. Each team tried to keep in mind that these teachers were busy and did not want to add to their burdens any more than necessary. Time was then allocated for sessions in which team members could work cooperatively in writing units which could be incorporated into the next year's course syllabi. Team leaders and members were heavily involved in meetings with administrators, counselors, and representatives from business and industry. Through this involvement, team members gained an appreciation of others' points-of-view, and vocational and academic teachers developed an appreciation for each other's goals. The last activity for the year involved the team leaders in the specialty areas working together to teach a five-day workshop at SIU–C on the integration of vocational and academic classes for teachers from across the state.

PRACTICAL APPLICATION

Through this program, the following academic/vocational partnerships were developed: (1) vocational and academic teachers have displayed cooperative, energetic attitudes toward Tech Prep; (2) vocational and academic teachers have made presentations to various groups about Tech Prep and its benefits to students; (3) both vocational and academic teachers have led planning sessions; (4) vocational and academic teachers have taught summer workshops at SIU–C for interested vocational and academic teachers from across the state; (5) a link has developed between vocational and academic teachers with an understanding and admiration for what each is trying to accomplish; and (6) vocational and academic teachers have recognized that much more can be accomplished through cooperation.

TECH PREP IN TEXAS: AN IMPLEMENTATION STRATEGY

Carrie Hughes Nelson
The Texas Higher Education Coordinating Board
Community and Technical Colleges Division

ABSTRACT

The process of developing a long-range plan for the statewide implementation of Tech Prep associate degree programs in Texas is presented in this paper from a state agency perspective. Discussed is the critical need for partnership development at state and local levels within the context of regional economic development. Issues relate to program quality assurance, equal access for all students, practical and effective curricula and student follow-up mechanisms, appropriate and timely professional development activities, and evaluation of program implementation strategies. The basis for the development of the state model for Tech Prep associate degree programs and the proposed method for implementation in Texas schools and community and technical colleges is outlined.

INTRODUCTION

Educational reform is often cited as the solution to the economic and social concerns facing our nation today. Many recognize that a nation's capacity to become economically competitive rests in its ability to adequately prepare and maintain a skilled and educated workforce. This is described in numerous reports, including *America's Choice: High Skills or Low Wages!* (Commission on the Skills of the American Workforce, 1990), *Workforce 2000: Work and Workers for the Twenty-First Century* (Johnston & Packer, 1987), and *What Work Requires of Schools: A SCANS Report for America 2000* (Secretary's Commission on Achieving Necessary Skills [SCANS], 1991). Each of these reports delivers the fundamental message that the current system of public education is out of date, has not evolved with technology, and does not provide students with the workplace skills needed by employers.

The system of public education in this country is like a glacier: Changes in direction are incremental, and scarred landscapes are stark reminders of the direction chosen. The reminders of the direction public education has chosen include unacceptable numbers of high school dropouts and unemployed, unskilled, and illiterate individuals. Like glacial ice, the substance of education itself does not resist change; rather, the organization resists change. As stated in *America 2000: An Education Strategy Sourcebook* (1991), the nation must commit to the restructuring of our system of education and these restructuring efforts must guarantee that all students be afforded high-quality, rigorous instruction that prepares them for success in our changing economy.

Tech Prep associate degree programs offer a tangible and immediate way to begin altering the direction of public education to address the changing needs of the American workplace. In his landmark publication *The Neglected Majority*, Parnell (1985) focused national attention on the concept of Tech Prep associate degree programs. These programs provide the majority of high school students (the future workforce) access to a quality and practical education. Properly designed, Tech Prep associate degree programs provide employers with skilled employees; broaden opportunities for students; and unite educators, educational programs, business, and industry.

By definition, Tech Prep associate degree programs include four years of competency-based instruction, bridging two years of high school and two years at a community or technical college (2+2). Content and sequencing of courses are designed to develop student competence in communication, science and mathematics, applied scientific principles, advanced technical skills, and workplace basic skills. These workplace skills are described in the SCANS report (SCANS, 1991) as five basic competencies (resources, interpersonal skills, information, systems, and technology) and three foundation skills (basic academic skills, thinking skills, and personal qualities).

As Tech Prep programs are developed and implemented in states across the nation, they take on unique characteristics based on the policies adopted that meet the requirements of each state. In their book, *Tech Prep Associate Degree: A Win-Win Experience*, Hull and Parnell (1991) give a valuable overview of the 2+2/Tech Prep program concept from the perspectives of secondary and community college educators. Additional information on high school program articulation strategies is offered by Lieberman (1988), and a listing and description of existing school and college linkages has been prepared by Wilbur and Lambert (1991).

BUILDING A MODEL TECH PREP PROGRAM FOR TEXAS

In 1986, Texas leaders recognized that the combination of dwindling state resources and the demand for economic diversification required the development of a system to promote economic growth by matching regional education and training programs with the needs of local employers. The system consisted of twenty-four regional partnership committees composed of representatives from secondary schools, public community and technical colleges, public four-year higher education institutions, the Job Training Partnership Act (JTPA)/Private Industry Council system, and employers. The purpose of these Quality Work Force Planning partnerships was to achieve an integrated education and training delivery system for technical and vocational education that prepared students for demand occupations. These committees constituted a strong partnership for Tech Prep consortia as they planned for program implementation. The tri-agency partnership of the Texas Higher Education Coordinating Board, The Texas Education Agency, and the Texas Department of Commerce was formed to facilitate these processes and is critical to their success.

Experience of 2+2+2 Pilot Projects: Defining Key Issues

Over the years, public higher education institutions in Texas have developed various linkages with public high schools. These program articulations, combined with the efforts of Quality Work Force Planning committees, formed a framework for the development of 2+2+2 pilot curriculum development projects. In 1985 using Carl D. Perkins Federal vocational funds, an articulated curriculum was developed in ten areas. These projects were intended to serve as a basis for Tech Prep curriculum development. Educators involved in 2+2+2 and Tech Prep programs in Texas met informally. Their deliberations, the result of an external evaluation of these funded 2+2 projects (Jackson & Gaines, 1991), and the critical issues of student access and program quality have shaped tri-agency state policy for Tech Prep program design and implementation.

Defining Access and Quality

Many problems faced schools and colleges as they began implementing of Tech Prep programs. Although state agencies considered each of these as they established Tech Prep program guidelines and policies, the most crucial issues were of access and quality.

Access was defined as the geographic availability of specific educational programs. In Texas, geographic access to programs and limited resources were serious considerations. With an area of 266,807 square miles divided into 254 geographically, economically, and multiculturally diverse counties, great distances often separated large urban centers from small rural colleges and schools. The number of independent school districts (1,054), and public community college districts and technical college systems (50) further complicated the issue of access because each required consideration as limited resources were distributed.

Access was also defined as the ability of students to participate fully in Tech Prep programs. In addition to the special populations students defined by the Carl D. Perkins Vocational and Applied Education Act (U.S. Congress, 1990), access applied equally to dropouts, high school students at various levels of technical and academic preparation, adult learners, and community and technical college students. Special consideration was given to avoid state policies that inadvertently limit access to these populations.

Quality was an even more difficult concept to define. State education agencies were faced with increasing demands for accountability, which required the development of performance measures and standards for the evaluation of program quality. A system for the development of indicators of quality occupational programs was provided by Hoachlander (1990). A comprehensive summary prepared by the Washington State Council on Vocational Education (1991) listed elements integral to Tech Prep program design. They included (1) a learner-centered approach to develop competence in academic and occupational skills identified and validated by business, industry, or labor; (2) continuity of instruction; and (3) student support including guidance and counseling. However, the most critical indicator of program quality was satisfactory employment of program graduates in a job related to the area of study.

CRITICAL ELEMENTS OF TECH PREP PROGRAMS IN TEXAS

The model for Tech Prep associate degree programs in Texas was based on the requirements of equal access, program quality assurance, and regional economic need. A joint statewide committee, representing secondary and higher education practitioners and business and industry, assisted by staff from the tri-agency partnership, devised guidelines for the development of Tech Prep programs. Ten of the most important elements of the Texas Tech Prep associate degree program design outlined in these guidelines were (1) a comprehensive career development and guidance program for students, beginning no later than grade seven; (2) a four-year high school Tech Prep graduation plan beginning in the ninth grade and consisting of a coherent sequence of courses that is transferable statewide and a two-year sequence of postsecondary courses consisting of a transferable core of technical and academic courses; (3) dual credit (high school and college) for selected high school technical courses; (4) the use of applied teaching methodology in all courses, including cross-integration of technical and academic competencies; (5) industry driven, cooperatively developed, competency-based technical courses (high school and community college) that have been restructured to eliminate duplication and to streamline instruction; (6) a minimum of grade-level, academic courses; (7) a multiple-entry/multiple-exit program design that provides access to all potential students and includes technical "leveling" courses; (8) an advanced skills component for the community college curriculum; (9) meaningful work-based learning experiences—including cooperative education, internships, clinical rotations, and apprenticeships; and (10) delivery of comprehensive and ongoing joint professional development activities for secondary and community college teachers and counselors.

To ensure program consistency statewide, a joint application procedure based on these guidelines is currently being developed for secondary schools and community and technical colleges planning to implement Tech Prep programs. These guidelines will require that programs are designed so that students exiting Tech Prep programs with a high school diploma are prepared to enter the workforce, continue the Tech Prep program of study at the community or technical college, or enter a four-year college or university for baccalaureate study.

DEVELOPING A PLAN FOR STATEWIDE IMPLEMENTATION

The State Board of Education and the Texas Higher Education Coordinating Board have cooperatively developed *Career Opportunities in Texas: A Master Plan for Technical and Vocational and Technical Education* (Texas State Board of Education & Texas Higher Education Coordinating Board, 1991) that serves as a blueprint for program improvement strategies. This plan reflects the emergence of standards and measures of quality programs in public secondary schools and community and technical colleges and focuses on the importance of regional planning partnerships for program development. Based on the master plan, the tri-agency partnership has developed a long-range strategic plan for the statewide institutionalization of Tech Prep associate degree programs.

To support this goal, the tri-agency partnership is releasing a series of requests for proposals (RFPs) for the competition of funds provided by the Perkins Act. This long-range plan is composed of four main phases: (1) Phase I – initial consortium planning; (2) Phase II – initial implementation; (3) Phase III – full institutional implementation; and (4) Phase IV – ongoing, comprehensive, and statewide evaluation.

Phase I was initiated in March 1991 with the tri-agency release of the first RFP designed to encourage the formation of planning consortia. Grants of approximately $50,000 each were awarded in July 1991 to twenty consortia that demonstrated sufficient size for effective project planning. Successful consortia demonstrated participation of at least one community or technical college, a sufficient number of public independent school districts to collectively represent an adequate number of potential students, the coordination with the appropriate Quality Work Force Planning committees and private industry councils, and appropriate relationships with the private sector. Planning consortia were required to assess local and regional employer needs, define potential occupations, identify current program offerings and options for integration, and identify specific in-school JTPA programming currently provided by each appropriate private industry council.

Phases II and III were initiated in October 1991 with the tri-agency release of the second RFP in the series. Multiyear Tech Prep implementation projects were awarded in January 1991 to consortia that designed preliminary five-year plans for institutional and/or regional implementation of multiple Tech Prep high school graduation career options and based curricular selection on labor market analyses, existing resources, and input from the

Quality Work Force Planning committees. Each plan included provisions for (1) recruiting and retaining special populations students; (2) outlining a plan for monitoring student placement, retention, and follow-up; (3) coordinating instructional approaches that emphasize education-to-work transitions; (4) identifying criteria for measuring student outcomes to assess program quality and effectiveness; (5) evaluating the delivery of counseling, preparatory, and support services; and (6) implementing an ongoing system for professional development activities for secondary and higher education vocational-technical and academic faculty, counselors, and administrators.

Phase III also began in October 1991 with the release of an RFP for the systematic and ongoing independent statewide evaluation of all Tech Prep program activities. The successful proposals addressed the assessment of (1) curriculum standards, (2) student performance measures and success factors; (3) articulation agreements; (4) business and industry involvement; (5) student enrollment, characteristics, and recruiting procedures; (6) professional development activities; (7) student preparatory services; (8) equal access and participation; and (9) student follow-up and job placement activities.

Continued funding of implementation grants will be based in part on the results of this ongoing evaluation process. Continuous feedback from this evaluation will improve local and statewide implementation. Concurrent development of statewide systems for the collection and reporting of program and student follow-up data by the tri-agency will support this effort.

Additional RFPs will be released for statewide dissemination of Tech Prep program information and for the coordination and delivery of a statewide professional development strategy. Timely implementation for these two strategies is critical for the success of a statewide process to institutionalize Tech Prep programs. Secondary and community college vocational and academic/technical teachers and counselors need immediate information on the design and intent of Tech Prep programs, integration strategies, and effective applied teaching methodologies.

CONCLUSION

Although Texas has established a long-range plan for statewide implementation of Tech Prep associate degree programs and preliminary guidelines for development, many issues need to be resolved as schools and colleges begin their program implementation. State leadership must have a clear vision of the future. The process of educational reform is incremental and the results of this change will not be evident for several years. The formation of effective partnerships at the state level will help maintain the momentum required for program implementation and for successful student outcomes. In Texas, this process is enhanced by the comprehensive system of regional Quality Work Force Planning committees that strengthen the commitment of public and private sectors working together to provide an educational system that will prepare our future work force. In the meantime, state agency personnel and educators must maintain optimism, enthusiasm, and hope and avoid any tendency toward apathy or cynicism. Through communication and coordination, quality Tech Prep programs will be developed that are accessible to all students.

REFERENCES

America 2000: An education strategy sourcebook. (1991). Washington, DC: U.S. Department of Education.

Commission on the Skills of the American Workforce. (1988). *America's choice: High skills or low wages!* Washington, DC: National Center on Education and the Economy.

Hoachlander, E. G. (1990). *System of performance standards and accountability for vocational education: Guidelines for development.* Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Hull, D., & Parnell, D. (1991). *Tech Prep associate degree: A win-win experience.* Waco, TX: Center for Occupational Research and Development.

Jackson, R. H., & Gaines, J. M. (1991). *Evaluation of federally funded 2+2+2 pilot projects in Texas: Interim evaluation report* (Unpublished report). Houston, TX: Decision Information Resources.

Johnston, W. B., & Packer, A. E. (1987). *Workforce 2000: Work and workers for the twenty-first century.* Indianapolis, IN: Hudson Institute.

Lieberman, J. E. (Ed.). (1988). *New directions for community colleges: Collaborating with high schools* (Vol. 68). San Francisco, CA: Jossey-Bass.

Parnell, D. (1985). *The neglected majority.* Washington, DC: Community College Press.

Secretary's Commission on Achieving Necessary Skills (SCANS). (1991). *What work requires of schools: A SCANS report for America 2000.* Washington, DC: U.S. Department of Labor.

Texas State Board of Education, & Texas Higher Education Coordinating Board. (1991). *Career opportunities in Texas: A master plan for vocational and technical education.* Austin: Author.

U.S. Congress. (1990). *Carl D. Perkins Vocational and Applied Technology Act.* [Public Law 101-392, Title III, Part E, Tech Prep Education.] Washington, DC: U.S. Government Printing Office.

Washington State Council on Vocational Education. (1991). *Building a word-class workforce: Indicators of quality in vocational education programs.* Olympia: Author.

Wilbur, F. P., & Lambert, L. M. (1991). *Linking America's schools and colleges: A guide to partnerships & national directory.* Washington, DC: American Association for Higher Education.

TECH PREP: AN INTEGRATED CURRICULUM

Till J. N. Peters
Grand Rapids Community College

Linda S. Peters
Grand Rapids Public Schools

THE SETTING

Grand Rapids, Michigan, is a city of almost 200,000 people on the western side of the state. It is about thirty miles from the eastern shore of Lake Michigan and halfway between Detroit and Chicago. The greater Grand Rapids area has a population of over five hundred thousand. African Americans, Native Americans, Hispanic Americans, Asian Americans, and first- and second-generation immigrants from all corners of the world are well represented in the area.

Major industries in the Grand Rapids area include office furniture manufacturing (Steelcase, Haworth, Herman Miller), automotive parts manufacturing (General Motors), consumer chemical products (Amway, Guardsman Chemical), insurance (Foremost), tool and die manufacturing (Autodie), and plastics manufacturing (Cascade Engineering, Nicholas Plastics). Manufacturing is predominant, but tourism, conventions, and agriculture are important to the area, as well.

In addition to fine public school systems, a number of parochial schools make significant contributions to K-12 education. Higher education is represented by both public (Grand Valley State University, Grand Rapids Community College, and local branches of Ferris State University) and private institutions (Davenport College, Aquinas College, Calvin College, Hope College).

The city of Grand Rapids is served by the Grand Rapids public schools. It is the second largest public school district in the state (after Detroit) and serves over thirty-thousand students, almost half of whom represent ethnic minorities. The school district includes forty-nine elementary schools, five middle schools, four comprehensive high schools, and several alternative schools and adult education sites. Until recently, it also included Grand Rapids Junior College. The region is served by two intermediate school districts, both of which have an impressive variety of outstanding vocational programs.

Grand Rapids Community College, formerly Grand Rapids Junior College, separated from the Grand Rapids Public Schools on July 1, 1991. A public vote in February 1991 removed the college from the school district and created a community college district coterminal with the Kent (County) Intermediate School District.

INTRODUCTION

The Tech Prep concept was conceived by Parnell, the former president of the American Association of Community and Junior Colleges, and first presented in his book, *The Neglected Majority* in 1985. At the time it was called "The 2+2 Tech-prep/Associate Degree Program" (p. 131). Parnell viewed the concept of a four-year technical curriculum spanning the eleventh grade through the college sophomore year as providing (1) structure, substance, and continuity in place of the formless "general education" noncurriculum through which almost half of our high school students drift; (2) meaningful, interesting, goal-oriented education to students who have none of these in order to help reduce the dropout high school; (3) a technical work force that has been educated beyond high school to perform those jobs that do not require baccalaureate and advanced preparation but that are critical to American services and lifestyles; (4) graduates who have greater self-esteem, better jobs, steady income, and the ability to rise above their present circumstances; and (5) an opportunity for high school and community/junior college administrators and teachers to form partnerships to build curricula that are for the good of students.

Since 1985, the Tech Prep idea has been received with interest in many places, and hundreds of programs now exist. The concept was written into law when Congress included it in the Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990, and appropriated sixty-eight million dollars to fund the establishment of projects. Parnell and Hull, (President of the Center for Occupational Research and Development [CORD] in Waco, Texas) have written a second book, *Tech Prep Associate Degree: A Win-Win Experience* (1991). This new work not only expands on the arguments presented in *The Neglected Majority* but also provides down-to-earth descriptions of how to develop, implement, and market Tech Prep programs.

THE TECH PREP CONCEPT

Curriculum is at the heart of the Tech Prep idea. Fundamentally, a Tech Prep program consists of a four-year, technically-oriented curriculum that starts in the eleventh grade and ends with the award of an associate degree. The Tech Prep model puts great emphasis on the breadth of the curriculum arguing that "it is the responsibility of the high school to open up the world for the high school student rather than close it down through narrow and specific job training" (Parnell, 1985, p. 144). Many projects have started earlier than eleventh grade, introducing strong guidance and counseling components or linking with other new curricular ideas like "technical education." The definitive characteristic of Tech Prep, however, remains a concerted curriculum that spans the late high school and the community college years and leads to an associate degree.

THE GRAND RAPIDS MANUFACTURING TECH PREP PROJECT

The Tech Prep program in Grand Rapids is aimed at preparing students to enter the manufacturing industries as master technicians. The program is entering its third year at one comprehensive high school and its second year at another. At Creston High School, the first school to implement Tech Prep, the initial enrollment was eighteen students. It grew to twenty-three in the second year, and it is starting out the third year with forty-four students. At Ottawa Hills High School, the enrollment was twenty-one during the first year of operation and is twenty-nine in the second.

The approach we have chosen in Grand Rapids is one in which the traditional high school curriculum and the traditional discipline-by-discipline approach to teaching that curriculum have been discarded. The new Tech Prep curriculum that replaces it is one that integrates material from English, vocational education (machine tools), economics, physics, mathematics, and computer science under the theme of manufacturing skills. The curriculum is an amalgam of teacher-developed materials, district objectives and competencies, and applied academics materials from CORD and other sources. Students enrolled in Tech Prep must meet the same graduation requirements and pass the same graduation competency tests as other students in the district.

After completion of high school, Tech Prep students can move right into one of three technical associate degree programs at Grand Rapids Community College: (1) Automated Manufacturing Technology, (2) Industrial Technology and Tooling, or (3) Plastics Manufacturing Technology. Entrance competencies for these three programs have been incorporated into the exit competencies these students master in high school.

During the first year of the manufacturing Tech Prep program in the high schools, all students are scheduled as a group for the full day. Each subject is scheduled for one class period except for manufacturing, which is two class periods. During the senior (second) year of the program, students are scheduled as a group for math, English, science, and one period of manufacturing. The remainder of the day can be used for electives and for completing needed graduation requirements.

We have found that group scheduling promotes student teamwork, an aspect emphasized heavily in the program. Group scheduling also results in a personal, caring learning environment that often leads to a feeling of family among the students and staff.

Teachers in the program plan their work in teams, although team teaching is usually not involved. The eleven teachers in the program teach other classes in addition to Tech Prep. They plan activities, develop curriculum, and devise student evaluation procedures. Most of this work is done before and after school. Both high schools are attempting to schedule a common planning period for the eleven teachers involved. The program is coordinated by a volunteer lead teacher in each school who serves as a site coordinator.

A key factor in the successful development and implementation of Tech Prep has been the involvement of the Grand Rapids Chamber of Commerce through the Manufacturers' Council, the Right Place Program, and the Grand Rapids Public Education Fund. Representatives of these groups provide valuable feedback and input for the teachers and administrators. They provide expert guidance to the curriculum-building process and support students and teachers with internships, tours, job shadowing, special training, equipment loans, material donations, and in-class speakers.

The curriculum for the eleventh and twelfth grades includes those course-related goals and objectives necessary to meet the district's graduation and competency test requirements. It has been expanded to include skills needed for success in the community college's technology programs and on the job. Foundation skills that transcend individual subject areas are incorporated throughout the high school program: problem solving; decision making; teamwork; work habits; personal management; and inductive, deductive, divergent, and evaluative thinking skills.

The Tech Prep exit competencies include (1) problem solving ability; (2) teamwork skills for functioning effectively as a group member; (3) personal management skills; (4) project management techniques; (5) technical report preparation and presentation; and (6) attitudes, behaviors, and knowledge required for obtaining and retaining a job, and advancing in a job.

Teachers emphasize integrated instruction throughout the Tech Prep program. Whenever possible, a given unit of instruction is the focus of all classes. Both learning and teaching are interdependent and interrelated. They are not governed by discrete, segmented content areas, the clock, or class schedule. Theory which is taught in one class is also applied not only in that class but also in other classes, where it is enhanced and extended. For example, when students study the concepts of rate and power in physics, they practice the appropriate calculations in math class, apply the concepts in the manufacturing class, and prepare engineering reports in English class. Learning is applied as often as possible.

Teamwork is important as teachers plan projects together and students implement them together. Class periods are combined as needed. For example, if additional time is needed for an applied physics and manufacturing project, teachers in the other content areas may share some of their class time so that the project can be completed. Teachers stress active learning; therefore, students must be active participants in the learning process. All activities heavily emphasize the development of project and personal management skills. Students participate in projects such as (1) designing the Tech Prep logo; (2) designing primary and secondary packaging; (3) designing and operating a profitable company; (4) mass production projects for the company; (5) investing company profits in the stock market; (6) building and testing crash cars; (7) building an ice boat and developing accompanying video presentations and promotions; and (8) researching trash generation, disposal, and recycling.

The program emphasizes high order thinking skills in all content areas. Creativity and critical thinking are stressed along with problem solving, abstract thinking, reasoning, adaptability, and responsiveness to change. Whenever possible, teachers use a process approach to learning. An active search for knowledge replaces rote learning.

Teachers model the program's teamwork orientation, and students frequently participate in cooperative learning activities. Group effectiveness results as students develop interpersonal, organizational, negotiation, and communication skills. Students have ample opportunity to learn both leadership and follower skills within the team setting.

Students enter the Tech Prep program as a result of their own interest; parents' interest; and recommendations by counselors, teachers, and administrators. Typically, students are underachievers with grades in the C to E range. Throughout their schooling, they have had high absenteeism, a lack of interest in school, frustration and failure, and interpersonal and disciplinary problems. All have been enrolled in what is loosely termed the "general" curriculum of the high school program.

RESULTS

Students are changing their behavior as a result of their participation in Tech Prep. Teachers in the program observe that students show a high level of cooperation and concern, wanting to help one another be successful. Students are showing greater motivation and initiative because they perceive that teachers care about them.

Attendance has improved dramatically. For example, one student who had averaged thirty absences per semester is now absent fewer than six times per semester. Self-esteem and self-confidence have improved for all students in the program, as well. Students who previously would rather fail a speech class than speak in front of a group have gained enough self-confidence to speak to a group of over one hundred manufacturing executives. Many are discovering that learning can be enjoyable and that they, too, can be successful at it.

Many students have improved their grades, as well. Students entering the program with D and C averages are doing solid C and B work after a year of Tech Prep. They are also thinking about going to college, an option which most had not previously considered.

At least six former students are continuing their education, four of them at Grand Rapids Community College.

When interviewed by a third party observer, most students commented favorably about the Tech Prep program. Student comments about the program included: (1) "Helpful—it prepares you for your future"; (2) "I do better with hands-on learning"; (3) "I'll have better skills, be more prepared when I graduate"; (4) "The teachers take time with you. The teachers really care what happens to us"; and (5) "I think I've grown up a lot this year, taken on more responsibility."

Group work or teamwork, heavily emphasized in Tech Prep, is generally well received by students. Their comments about such efforts included: (1) "Two heads are better than one"; (2) "Industry works in teams"; and (3) "Makes you think, work with another person. It's good."

As comments indicate, students notice changes in themselves as a result of the program. One student indicated his being more serious about life. Another indicated his getting more done at home and learning to do "stuff" as it comes, rather than waiting.

Because of the radicalness of the Grand Rapids project, not all students are comfortable in the program. Some students prefer learning in a more traditional format and prefer assignments which have right or wrong answers and are uncomfortable with activities that require them to figure out what to do. Such students often leave the program. Following the first year of Tech Prep, several students expressed their discontent with the concept of being together in a group all day. This approach was being modified for the senior year of the program.

Parents' reactions to their children's participation in Tech Prep are generally positive. During parent-teacher conferences, parents frequently comment on the change in attitude students are displaying at school and at home.

Overall, teachers have positive feelings about the Tech Prep program. Only one request for reassignment is currently being processed. There have been periods of frustration for the teachers, but most comment on the positive impact of working with a mix of staff members. It is a new experience for them to actively plan and coordinate instruction with teachers in other disciplines and to share in decision making. All agree that the program is heading in the right direction. One teacher describes Tech Prep as the necessary "retooling of education."

To date, the impact of the Tech Prep program is limited to a small number of students and teachers in one occupational area. However, steps to broaden the program are being taken, including (1) expansion of the concept to include other occupational areas; (2) elimination of the general curriculum at one or two high schools; (3) involvement of other high schools in Tech Prep; and (4) incorporation of pre-Tech Prep programming, including technology education classes at all middle schools and high schools, Educational Development Plans (EDPs) starting in the ninth grade, creation of technology/math magnet middle and elementary schools, and more applied academics courses.

Because of the relatively low enrollment in the program to date and because few Tech Prep students have entered the community college, impact on the college is low. However, when Tech Prep is fully implemented in its feeder high schools, the impact is expected to be great.

CHALLENGES FOR THE FUTURE

For the foreseeable future, the community college must be able to serve students both with and without the benefit of Tech Prep education in high school. This is especially true in Michigan, where both local school districts and community colleges have a great deal of autonomy and the state is not mandating curricular changes.

The challenges are significant. It will be necessary as student numbers increase to acknowledge the Tech Prep education of the eleventh and twelfth grades with changes in curriculum at the community college. Although the Tech Prep ideal would suggest that the community college curriculum be redesigned with the high school Tech Prep curriculum as the feeder, this approach will only work if all students entering the community college program have the same Tech Prep experience in high school. It will still be a long time before that will be the case in Michigan.

Perhaps even more serious will be the need to provide instructional and methodological acknowledgment of the Tech Prep experience. Students who have spent the last two years of high school solving challenging problems, working intensively in teams, participating with their teachers in directing their own learning, and focusing on the useful applications of knowledge will not be content to sit in lectures, passively taking notes and regurgitating rote learning on examinations.

Some educators are unwilling to give up completely the nonspecific, unfocused high school "general education" option. It will take a great deal of perseverance, education, and argumentation to change minds. Two states, North Carolina and Oregon, are already deleting the general education option, but only by administrative or legislative fiat. It is unlikely that such change will happen in Michigan by any process other than gradual evolution.

Wide-scale acceptance of Tech Prep will take effort. Teachers at all levels will need more time for planning, developing curriculum, and enhancing their own knowledge and base of experience. For the time being, grant funds can help meet that need. Over the long term, however, school districts and community colleges must rethink what it is that teachers are paid to do and taxpayers must vote the funds to make that role viable.

Finally, Tech Prep needs to be accepted as the long-awaited reform for which American education hungers. Other innovations must be linked to and integrated with Tech Prep. Counterproductive "more of the same" approaches must be scrapped.

REFERENCES

Hull, D., & Parnell, D. (1991). *Tech Prep associate degree: A win-win experience.* Waco, TX: Center for Occupational Research and Development.

Parnell, D. (1985). *The neglected majority.* Washington, DC: Community College Press.

EDUCATIONAL REFORM: A BROADENING OF TECH PREP

James Suksi
Northern Michigan University

This paper is designed for community college administrators, counselors, and instructors working with students who desire to earn an associate degree in an area of technology, but are ill-prepared for such a pursuit. Information presented addresses a technical foundations program which provides students with a background comparable to that recommended for high school students who would complete the first two years of a Tech Prep educational program. The curriculum is flexible and adaptable to various needs.

THE CONCERN

Considerable attention has been directed to the development of Tech Prep education programs designed as cooperative ventures between secondary schools and community colleges. Articulation is an essential element in any such program. The articulation agreement commits the high school and community college to a program designed to provide students with a nonduplicative sequence of progressive achievement leading to competencies in a Tech Prep education program. The combined secondary postsecondary program should (1) lead to an associate degree; (2) provide technical preparation in at least one field of mechanical, industrial, or practical art, trade or applied science; (3) provide competence in applied academics (mathematics, science, and communications); and (4) lead to placement in employment.

Tech Prep education programs have evolved primarily to address (1) the more than one third of our nation's high school students who enroll in the general curriculum as opposed to college preparatory or vocational programs, (2) the almost one third of the nations' high school students who enroll in vocational programs, and (3) the lack of financial and physical resources in most secondary schools to initiate and maintain technical education programs that accurately reflect marketplace demands (Parnell, 1985).

While national reports call for educational reforms, advocates recognize that current concerns about instructional quality stem from education's inability to satisfy marketplace and societal demands. The general education curriculum provides little structure, insufficient substance, and little motivation for the typical student (Center for Occupational Research and Development, 1985). The marketplace demands that education and training emphasize such areas as information processing, communications, the environment, health care, computer integrated manufacturing, space exploration, bioengineering, and genetics. However, the majority of current secondary occupational programs only address agriculture, home economics, and industrial arts areas, which have limited marketplace demand. Thus, many of our schools and students are ill-equipped for the kind and degree of adaptability necessary to function in the working world.

EDUCATIONAL REFORM

There has been a grassroots resurgence for a return in education to the basics of reading, writing, and mathematics. However, education for the year 2000 and beyond will need to emphasize communication skills, critical thinking techniques, and scientific and technological literacy. Employers cite employees' ability to learn as an important criteria in selecting, training, and promoting personnel. Yet the educational system spends little time developing thinking process skills such as problem solving, analysis, and synthesis. Upper level high school mathematics and science courses continue to be taught in an abstract and theoretical manner to perhaps two thirds of the student body who desperately need more development of practical critical thinking skills (Center for Occupational Research and Development, 1985).

THE CHARGE

High school dropouts, graduates with limited skills, displaced homemakers, and immigrants have "slipped" through the educational system. Their numbers are significant, and they desire training that will allow them opportunities to find employment beyond the entry level. Representative Ford of Michigan, when introducing HR 5290, the Tech Prep Education Act, stated that "Tech Prep education will clearly contribute to lowering the unemployment rate" (Congressional Record, 1988, p. 130). Therefore, postsecondary education must address the needs of those without secondary Tech Prep experience. It becomes a question of our ability to condense a postsecondary experience that addresses the secondary Tech Prep content into less than one year.

In an effort to assist the under-prepared, out-of-school population interested in earning an associate degree in a technical area, the School of Technology and Applied Sciences at Northern Michigan University (STAS–NMU) has initiated a technology-oriented developmental program. The program will provide learning experiences comparable to those afforded high school Tech Prep students. The curriculum will address the Technical Preparation Competencies recommended by the Michigan State Board of Education Tech Prep Task Force. The goal is to deliver a one semester program.

Cameron (1988) recommends the development of a technical preparation core curriculum addressing learning experiences in four areas: (1) abstract thinking, (2) attitudinal development, (3) technical literacy, and (4) technology education. Abstract thinking involves the development of reasoning, problem-solving, and decision-making skills that should be part of all courses, but especially in technology education, mathematics, science, English. Attitudinal development includes the development of social and work skills which include interpersonal skills, adaptability, accountability, employability, entrepreneurship, and work ethics. Technical literacy includes the development of computer literacy and other technical skills relevant to a particular program. Technology education is the developing insights into technology, understanding its significance, and assessing its social and cultural impact.

In addition to the four learning experience areas identified by Cameron (1988), specific competencies have been developed for abstract thinking and attitudinal development. Abstract thinking includes reasoning, problem-solving, and decision-making competencies. The competencies required are as follows:

1. The student should be able to gather and interrelate facts and input and sift through details to identify, conceptualize, and recognize the implications and significance of problems and resolve them through analyses, recommendations, decisions, and conclusions.

2. The student should be able to recognize the inconsistencies between the way things are and the way they should be and initiate problem-solving techniques to resolve a problem.

3. The student should be able to distinguish among facts, assumptions, and opinions.

4. The student should be able to use inductive and deductive reasoning, including diagnosing and troubleshooting technical problems.

5. The student should be able to use skills, analyze risks and benefits, develop and describe alternatives, make comparisons, draw conclusions and make recommendations, and address ethical concerns.

6. The student should be able to relate knowledge, experience, and principles to new situations.

7. The student should be able to change behaviors.

8. The student should be able to evaluate, adapt, and develop logical steps to implement decisions.

These abilities should be developed in all coursework, but especially in mathematics, science, communications, and in technical course areas.

Attitudinal development stresses interpersonal adaptability, employability, entrepreneurship, and work ethic competencies. The student should demonstrate the abilities listed in Table 1.

Table 1

Attitudinal Development Competencies the Student Should Demonstrate

1. Relate to and develop good working relationships with superiors and coworkers in an occupational role; demonstrate behaviors appropriate to the workplace; understand the value and function of courtesy, compassion, fairness, humor, and positive attitude in human relationships; deal with conflict or criticism in a rational, productive manner; understand and be able to participate in the team concept; understand the basis for thoughts, feelings, motivations, and behavioral styles of others, and interact accordingly; recognize social and cultural implications and follow accepted societal rules.

2. Adjust to change in schedules, assignments, procedures, personnel, and policies; to engage in continued learning in job training to improve or upgrade skills; or to learn alternate or more difficult skills.

3. Complete the procedures necessary to obtain employment including filling out applications, writing resumes, and preparing for an interview; to identify personal and technical skills and abilities and outline work objectives; to comprehend the relationship between job specifications and personal characteristics and to develop competencies to match the specifications; to understand the principles of competition, cooperation, and leadership in a work environment; to understand the principles of compensation to include pay, benefits, perquisites, and intangibles.

4. Understand how a business is organized and capitalize on the role of management and competition and the demands of productivity, profitability, and risk; to understand the need for structure and organization in an enterprise; to understand the role of experimentation in research and development in technological occupations; to understand accountability for results; to understand that progress in technology is a function of initiative, innovation, and trial-and-error experimentation, and that failure, as well as success, in experimentation, is to be regarded as an essential ingredient in progress.

5. Accomplish assigned tasks with or without supervision; to demonstrate ingenuity in meeting challenges; to concentrate on the job to be done; to take pride in quality craftsmanship or service; to exercise initiative; to accept and seek out responsibility; to keep tools, machines, and work stations in good order; to distinguish between what belongs to the organization and what belongs to the person; to interpret goals, make realistic plans, set priorities, and to take action to meet them; to maintain dependable attendance and punctuality; to maintain standards of appearance, dress, grooming, and personal hygiene; to understand the meaning of "work" and the significance of "a day's work for a day's pay." (p. 5)

Source: Cameron, S. W. (1988). Tech Prep Partnerships: Executive Summary. Lansing: Michigan State Board of Education.

The Michigan State Board of Education mandated specific competencies for students in mathematics, science, and communications courses. These competencies are listed in Table 2.

Table 2
Competencies Established by the Michigan State Board of Education

1. MATHEMATICS – The student should demonstrate an ability to calculate through the level of ratios, proportions, and percentages; support ideas quantitatively; estimate; use division, multiplication, addition, and subtraction with real numbers, decimals, fractions, integers, roots, and powers; calculate distance, weight, area, volume, and time; use the metric system and convert between metrics and traditional systems; read and create charts, tables, and graphs; apply mathematics in the solution of economic and technical problems.

2. SCIENCE – The student should demonstrate the ability to recognize medical, physical, chemical, and biological problems and solve selected problems through the application of basic scientific principles.

3. COMMUNICATION – The student should demonstrate the ability to read, comprehend, and interpret written directions, technical publications, reports, policies and procedures, diagrams, and charts. The student also will demonstrate an ability to ask and answer questions coherently to obtain clarity and verify information; conceive, develop, and organize ideas about a subject and present them clearly in standard oral English; present oral reports succinctly; take part in and interpret the exchange of ideas in discussions. (pp. 4-5)

Source: Cameron, S. W. (1988). Tech Prep Partnerships: Executive Summary. Lansing: Michigan State Board of Education.

PROGRAM DEVELOPMENT

The program development curriculum presented addresses all of the competencies recommended for technical preparation by the Michigan Tech Prep Task Force. As such, the model is easily adaptable to any community college desiring to offer similar learning experiences. Ideally, faculty participating in the program should be provided with an inservice program directed to Teaching for Critical Thinking prior to initiating the program. If students are to be successful in their pursuit of an associate degree and future career, they must learn to read, write, speak, and view critically (Paul, 1990).

PROGRAM PLAN

The goal of the STAS–NMU program is to strengthen the learner's foundation of general skills, those basic skills necessary to successfully complete a technology-related associate degree. Major components of the integrated program include assessment, counseling, advisement, faculty inservice, course delivery, program evaluation, and follow-up.

Persons interested in the program are required to participate in a pre-enrollment assessment. The purpose of the assessment is to determine applicants' areas of interest, general aptitudes, reasoning skills, and mathematics and reading levels. Applicants with mathematics and reading levels below the eighth grade level are counseled into specific remediation programs. Counselors discuss the students' strengths and weaknesses and suggestions are provided about the technical program choices. Potential candidates are then assisted in planning course schedules and obtaining financial aid.

Faculty members participate in a teaching for critical thinking inservice workshop. The purpose of the workshop is to expose teachers to methods of incorporating critical thinking into and across the curriculum. Methods and strategies for teaching higher-order thinking, writing, listening, speaking, and viewing skills are stressed. The development of technological literacy, higher-order thinking skills, and positive social and work attitudes is the binding force of the curriculum.

The curriculum design employs the integrated model defined by Fogarty (1991) as "an interdisciplinary approach matching subjects for overlaps in topics and concepts with some teaching in an authentic integrated model" (p. 75). Evaluation is a major factor in the success of any program. An assessment of students, faculty, course content, delivery systems, auxiliary services, support services, and financial resources must be conducted if a program is to grow and prosper. Evaluation results provide information for program improvement and strategic planning.

Follow-up studies provide valuable information in assessing program effectiveness. Program modifications can be implemented if there is rationale for the action. Initial follow-up activities should to determine the overall effectiveness and appropriateness of the curriculum, and the success or failure of students who complete the program is the truest measure of program effectiveness.

THE CURRICULUM

The course curriculum is designed to meet the requirements already discussed. Course descriptions and credit for each course are described in Table 3.

Table 3

The Curriculum for the Tech Foundations Program

Modern Technology: Discusses the development of technology and promotes technological literacy by tracing the evolution of man as a user of tools and the impact these tools have had on his intellectual development. (2 credits)

The Systems Approach: Integrates technological literacy with understanding and utilizing information systems to resolve problems. (2 credits)

Computer Literacy: Designed to explain the significance and role of the computer in society and addresses the introductory concepts of computer hardware, software, and operations. (2 credits)

Applied Communication: Designed as a practical learning experience to strengthen communication skills by integrating reading, writing, listening, and speaking activities in a simulated workplace environment. (2 credits)

Applied Mathematics: Presents topics in arithmetic, algebra, geometry, trigonometry, probability, estimation, and problem solving that are oriented toward the application and practice of mathematical concepts and skills in solving work-related problems. (3 credits)

Principles of Technology: An applied physics course dealing with concepts in basic mechanical, fluid, electrical, and thermal energy systems oriented toward contemporary technology through discussions, video presentations, readings, math "problem-solving" labs, and hands-on physics labs with the development of technological literacy and problem-solving skills stressed. (4 credits)

– or –

Applied Biology/Chemistry: Integrates biology and chemistry principles into a single interdisciplinary whole and addresses science concepts in terms of applications with emphasis on occupationally relevant hands-on problem solving activities. (4 credits)

CONCLUSION

Based on the research and competencies developed by Cameron (1988), a systematic approach to implementing tech foundations at the postsecondary level is achievable. Education needs to initiate reforms that will recapture and educate lost populations to make them productive members of a highly skilled technical workforce. The program suggested in this paper provides an opportunity for people to prepare for admission to technical programs at the associate degree level.

REFERENCES

Cameron, S. W. (1988). *Tech Prep partnerships: Executive summary.* Lansing: Michigan State Board of Education.

Center for Occupational Research and Development. (1985). *Two-plus-two articulation: A guidebook for educational planning.* Waco, TX: Author.

Congressional Record. (1988, September 20). *Extensions of remarks: Tech Prep Education Act.* Washington, DC: U.S. Government Printing Office.

Fogarty, R. (1991). *How to integrate the curricula.* Palatine, IL: Skylight Publishing.

Parnell, D. (1985). *The neglected majority.* Washington, DC: Community College Press.

Paul, R. W. (1990). *Critical thinking: What every person needs to survive in a rapidly changing world.* Rohnert Park, CA: Center for Critical Thinking and Moral Critique.

SECTION II
INTEGRATION OF OCCUPATIONAL AND ACADEMIC EDUCATION

THE HIGH TECHNOLOGY HIGH SCHOOL: A CAMPUS-BASED COLLABORATIVE EFFORT

Brian McAndrew
Thomas Bistocchi
Monmouth County Vocational School District

Gregory DeCinque
Tunxis Community College

INTRODUCTION

The Monmouth County (New Jersey) Vocational School District Board of Education and the Brookdale (New Jersey) Community College Board of Trustees have entered into a collaborative agreement to provide a continuous program of technology education. This initiative is in keeping with the Governor's Commission on Science and Technology, which looks to the New Jersey vocational schools and community colleges as the primary providers and centers for technological training. The Monmouth County Vocational School District has constructed a high school building on the college campus for a student body of two hundred students in grades ten through twelve. The school opened in September 1991. The High Technology High School is accessible to the newly constructed, state-of-the-art, $13 million Advanced Technology Center that opened in January 1990. High school students, who come from the twenty-five high schools within the county boundaries, attend the school on a full-time basis.

The high school facility, located adjacent to the college's Advanced Technology Center, accepted its initial tenth grade class of sixty students in September. Successive tenth grade classes of seventy students each will be accepted in September of 1992 and 1993, bringing the total population to two hundred. The initial class has student representation from twenty-two of the twenty-five Monmouth County high schools. The class is thirty-five percent female and twenty-five percent minority. Admission to the school is competitive and based on the following criteria: (1) grade point average; (2) score on an admissions test that identifies abilities in mathematics, science, and communication skills; (3) standardized test scores; (4) counselor and teacher recommendations; and (5) a personal interview with the prospective student and parent(s). Every effort has been made in the recruitment process to be both gender and minority sensitive in an attempt to attract these populations into this rigorous technology curriculum. Each of the fifty-five resident districts in Monmouth County submitting an application is guaranteed at least one space for students who meet minimum requirements. Minimum requirements for a qualified applicant are defined as an overall score of at least forty-two out of sixty on the aforementioned criteria. The tuition of six thousand dollars per student and transportation are the responsibility of the student's resident district.

The collaboration between the Board of Education and the Board of Trustees provides the best of both worlds for residents, students, parents, and business and industry in Monmouth County. The new campus complex will graduate technologically trained people who are vitally needed. The sharing of laboratory training facilities and equipment provides a direct linkage between the secondary and college level programs, reduces duplication of equipment and laboratory space, offers opportunities for exchange by secondary and college faculties and administration, and fosters a continuous curriculum flow from grades ten through fourteen. In addition, the college campus provides a central focal point for potential employers and expands the opportunity for the nontraditional student to see a concrete relationship between high school classwork, the associate degree program, and future employment. Through this linkage of high school and college, the student who might not have been interested in seeking technology training can be motivated to select a career path in these areas.

CURRICULAR PROGRAMS

Two curricula tracks are offered to students, Engineering Prep and Technician Prep. The Engineering Prep program is an academic, theory-based curriculum that integrates the mathematics and laboratory sciences with engineering and telecommunications technologies. It will prepare the graduate for a traditional four-year baccalaureate degree or a two-year associate degree at Brookdale. All students in this program will take successive courses in mathematics (geometry, Algebra II, and calculus); science (physics, chemistry, and advanced placement in biology), foreign language, social studies, English, and health/fitness. In addition, all students are required to complete a computer-aided design course in their initial year of enrollment.

Approximately eighty-five percent of the students in the initial class are enrolled in the Engineering Prep program. Fifteen percent are enrolled in the Technician Prep program. This program, which is based on skill development, is designed to be more "hands on" and prepares graduates for entry-level positions in the related technologies of engineering and telecommunications. Graduates of the Technician Prep program will be encouraged to pursue a two-year associate degree program at the college.

During their first year of study at the High Technology High School, all tenth grade students complete a survey course in technology education that is offered in the college's advanced Technology Center and taught by the college faculty. The survey course includes digital electronics, computer-aided manufacturing, telephone technology, electronic music, visual presentation, robotics, automotive technology, radio, and audio/video technology. Each technology area is presented in a four-week session. During the junior year of high school, students will specialize in one or two of these technology areas. A mentoring program with local technologically based firms such as AT&T, Bell Laboratories, and Concurrent Computer is being planned for the twelfth grade. The college's Credits in Escrow and Fast Start programs are available to all students. Several students in the current tenth grade class have availed themselves of the Fast Start program by taking college-level science, mathematics, and engineering courses beyond their regular school day.

The fourteen thousand square foot High Technology High School facility has been designed with state-of-the-art electronic technology. Students have access to electronic data transfer, CD-ROM, laser discs, and the college's four satellite dishes. All academic and laboratory science classes are taught in the high school, which is equipped with two computer centers and a comprehensive science laboratory. Health/fitness classes are taught by college faculty utilizing the college gymnasium and fitness centers. The college has also made the library accessible to all high school students.

COLLABORATIVE AGREEMENT

The collaborative agreement signed by the Board of Education and the Board of Trustees provided a mechanism for operationalizing the joint project. The tenets of the collaboration agreement are listed in Table 1.

Table 1

Collaboration Agreement Between Monmouth County Board of Education and Brookdale Community College Board of Trustees

1. There will be a mutual respect and observance of all contracted arrangements in existence between the Brookdale Community College, its employees, and their representatives and the Monmouth County Vocational School District's High Technology High School, its employees, and their representatives.

2. The High Technology High School Principal and Brookdale Community College's Dean of Instruction will establish an Administrative Council that would meet regularly to review, recommend, and monitor mutual activities of the high school and the Advanced Technology Center.

3. A college liaison officer will be designated by the Dean of instruction to work closely with the high school principal's office, the director of the Advanced Technology Center, the various learning chairs, and the dean's office on matters relating to the high school and the college.

4. The High Technology High School Principal and the Dean of Instruction will develop guidelines for programs relating to the mutual use of facilities, curriculum, and staffing.

5. Enrollment for the first year of operation will be restricted to 10th grade students. An additional grade level will be added each year until grades 10 through 12 are on campus.

6. Integration of high school students into campus life and use of related facilities and services will be limited during the startup years.

7. In-kind services and financial arrangements for use of facilities and services will be agreed upon by the business offices of the college and the school district.

8. The Monmouth County Vocational School District and its administration will accept full responsibility for gaining appropriate State Department of Education approval for the curriculum, schedule, faculty certification, and use of the high school building.

9. The basic high school courses necessary to fulfill New Jersey State Department of Education requirements will be taught to students in the high school building by high school staff. The introductory and advanced technology courses, with their related labs, will be taught to students in the Advanced Technology Center by college faculty and those high school faculty who were qualified in the subject area and trained in the use of the technology equipment.

Source: Monmouth County Board of Education & Brookdale Community College Board of Trustees. (1989). *The Collaborative Interim Agreement* (Item in File No. 2.6). Lincroft, NJ: Author.

A final outgrowth of the collaboration was the development of the High Technology High School Advisory Council. The council was comprised of secondary school representatives from throughout Monmouth County (superintendents, principals, teachers, and board of education members), college representatives, and members of the business and industry community. The council has been active in all planning and development stages of the high school including curriculum mapping, facility development, acceptance criteria, and public relations.

The High Technology High School is truly a school of choice. It has been designed as a specialized, single-purpose high school for students who are interested in studying technology, mathematics, the sciences in much greater depth. It affords these students the unique opportunity to attend high school on a college campus, be instructed by college professors, and take high school and college courses concurrently. Because of the need to share facilities with the college, the actual high school student schedule closely resembles that of the college student. Individual academic and laboratory classes meet on the average of three times per week for longer than the traditional blocks of time in comprehensive high schools. The project is an experiment that is being carefully scrutinized by parents, the community, Monmouth County, and the state of New Jersey. The initial returns have all been positive, and the prospects for growth and success of this innovative program are great.

REFERENCES

Monmouth County Board of Education, & Brookdale Community College Board of Trustees. (1989). *The collaborative interim agreement* (Item in File No. 2.6). Lincroft, NJ: Authors.

AN EVALUATION OF THE OUTCOMES OF THE APPLIED MATHEMATICS DEMONSTRATION SITES IN INDIANA

Jerry Pepple
Steve Tozer
Frank O'Connor
University of Illinois at Urbana-Champaign

INTRODUCTION

In a recent joint publication of the U.S. Department of Education and the U.S. Department of Commerce (1988), research findings indicated that the kinds of reading, writing, and analytical tasks workers routinely perform are different from those students are taught in schools and in general adult literacy programs. To assure that students are able to adapt to the changing nature of the workplace, curriculum revitalization efforts in vocational and academic education must address several components. It is imperative that secondary and postsecondary vocational programs meet the fundamental responsibilities of public education to ensure that all students attain appropriate levels of achievement in areas necessary for their development toward either immediate employment or advanced education.

Many researchers in vocational education have concluded that there is little information available on the impact of vocational education as a means of enhancing academic learning experiences. They have determined that further research needs to be conducted to determine how vocational education courses can be instrumental in the development of basic skills in the applied academic disciplines.

Research Goal

The primary goal of this research was to determine the effectiveness of the applied academics curriculum materials in integrating academic areas to boost academic achievement and occupational preparation in secondary schools. With up-to-date findings regarding the use of applied academics curriculum materials, educators could make the appropriate adjustments to effect qualitative improvements in the secondary schools. Other goals included developing a better understanding of the role of the teacher and administrator in integrating academics into vocational subjects, infusing academic courses with applied learning activities, and identifying local policy and procedure guidelines which encourage or discourage to the integration of vocational and academic education.

Project Objectives

The overall purpose of this project was to assess the student and instructional program outcomes which resulted from implementation of nationally developed applied academics curriculum packages such as Applied Communication and Applied Mathematics. As these materials were implemented and used in various ways by schools and individual teachers, this study assessed the gains in basic academic skills in mathematics and communications.

The outcomes assessed included the impact of the Applied Communication and Applied Mathematics demonstration sites on (1) students' occupational and communication and mathematics skills, knowledge, and attitudes; (2) students' abilities to demonstrate effective application of communication and mathematics competencies in a workplace and in their personal lives; (3) teachers' abilities to demonstrate practical, useful applications of competencies; (4) vocational and academic teachers' collaborative efforts to assure relevance and practical application of instruction; (5) students' attitudes toward communication and mathematics competency development; (6) students' academic achievement in communication and mathematics competencies; and (7) vocational and academic teachers' and administrators' communication and cooperation. Information was also gathered to assess the strengths and weaknesses of Applied Communication and Applied Mathematics instructional materials and participating teachers' attitudes toward instruction, teaching, and students' achievement as related to these materials.

The following research questions were addressed:

1. Are there significant differences in the academic achievement of students taught from the applied academics packages as compared to those taught with traditional instructional approaches?

2. How do teachers select and use the applied academics packages in their courses?

3. What do the faculty perceive as the advantages and disadvantages of the applied academics packages?

4. What are the students' perceptions of the advantages and disadvantages of the applied academics packages?

5. In what types of programs are teachers implementing the applied academics curriculum packages?

6. What changes and outcomes do teachers, administrators, and others expect to observe when the applied academics curricula packages are implemented?

7. In what ways are applied academics curricula materials used to meet an institution's graduation requirements in communications, mathematics, or science?

Sample Selection

Selection of the 1990-1991 Applied Communication and Applied Mathematics demonstration sites was coordinated through the Indiana Department of Education, Center for School Improvement and Performance, Vocational Education Section. The Indiana Department of Education utilized Carl D. Perkins Vocational Education Act funds to implement ten Applied Mathematics and eight Applied Communication secondary level demonstration sites throughout the state for the 1990-1991 school year. These sites were established as the result of a competitive request for proposals and funded in the amount of $2,100 to $2,600 per site for Applied Communication and $3,100 to $3,800 per site for Applied Mathematics. Some of the demonstration sites had previously been involved in the use of applied academics curricula, while others were new to the materials.

The Applied Mathematics demonstration sites included five area vocational schools, five comprehensive high schools, and a total of two hundred thirty-four students. The two hundred thirty-four students included sixty-four females and one hundred seventy males. The students included eighty-eight freshmen, thirty-six sophomores, fifty-four juniors, and fifty-six seniors. Of the two hundred thirty-four students, one hundred three were enrolled in a vocational education program. The control group included an additional one hundred eighteen students enrolled in general math classes at six sites.

The Applied Communication demonstration sites included four area vocational schools, four comprehensive high schools, and a total of three hundred seventy-seven students. Of these students, one hundred fifty-two were females and two hundred twenty-five were males. The class breakdown indicated nine freshmen, eighty-two sophomores, forty-one juniors, and two hundred twenty-five seniors. Of the three hundred seventy-seven students, two hundred sixty-one were enrolled in a vocational education program. An additional three hundred seventy-seven students at the five sites served as the control group. Refer to Appendix A for a more detailed description of the demonstration sites.

METHODOLOGY

Gains in students' educational achievement were influenced by student, family, school, teachers, and classroom characteristics. In this evaluation, the researchers suggested that classroom characteristics, especially teaching methods and student level, were particularly relevant.

To measure the effect of applied materials and teacher and student characteristics, a sample design was used that drew on multiple classrooms from selected vocational and nonvocational schools where the applied academics materials were being taught. An extension of an educational production function was estimated to model the effects of the inputs on achievement and to control the dependence that occurs among observations. In particular, the researchers estimated by using multilevel models that incorporated independent variables (i.e., use of applied materials, student and teacher characteristics) measured at different levels and used an outcome that reflected gains in student achievement as measured by improved test scores between the beginning and the end of the school year. Similar models have been used in the analysis of educational data (Bryk & Raudenbush, 1988).

Traditional models of student learning specified how one set of variables ultimately affected selected outcomes through intermediate sets of variables (i.e., how initial variables such as the school's initial physical or human resources affected teachers' performances, which in turn affected students' outcomes). The multilevel approach chosen for this study differed from the traditional path of analysis because the approach allowed for the assessment of the relationship between variables at a given level as affected by other variables. For example, the relationship between student characteristics and student outcomes was influenced by classroom level variables, and in turn, classroom and student variables were influenced by school resources.

This assessment project built upon efforts funded by the National Center for Research in Vocational Education (NCRVE), University of California at Berkeley. Through the NCRVE project, data collection instruments were developed and pilot tested during the 1989-1990 school year in Illinois. These instruments were revised, reprinted, and disseminated through inservice workshops to identified experimental sites in Indiana in September 1990. The sites were selected by Indiana Department of Education (IDOE) personnel using predetermined criteria for selection. Comparison classes were identified for use as control groups at most sites. One round of on-site visits was made in September and October of 1990 to most schools participating in the study in order to observe the use of the materials and answer questions and concerns from teachers and/or administrators. The participating teachers gave pre- and posttests as they used the applied materials. The data was collected by IDOE personnel for analysis. NCRVE funding for this research ended December 31, 1990. Students in the ninth, tenth, eleventh, and twelfth grades in the selected schools were tested using the applied academic materials, as were the control classes. The instructors used the materials in both vocational and academic settings.

INSTRUMENT DESIGN

Teacher and student questionnaires were developed to collect the following information: (1) demographic data, (2) participant expectations and outcomes, and (3) educational background. Instruments were also developed to collect information on the teachers' perceptions of the applied materials as they used the modules/units. The instruments used to collect quantitative data on student outcomes were (1) Applied Communications Assessment booklets—twenty criterion-referenced, multiple-choice test questions developed for each module and printed in booklet form; (2) Applied Mathematics Assessment booklets—twenty criterion-referenced, multiple-choice test questions identified from the questions that the Center for Occupational Research and Development (CORD) prepared during the development of the Applied Mathematics materials; (3) Mathematics Achievement Assessment booklets—sixty-three norm-referenced, multiple-choice test questions from the test bank items prepared by the Illinois State Board of Education and the

Mathematics Assessment Advisory Committee to assess student achievement in the areas of computation, ratios and percentages, measurement, algebra, geometry, data collection and analysis, and estimation; and (4) a survey of the instruction students received concerning the use of calculators in mathematics classes, the type of calculators used, and the use of calculators during tests.

The Applied Communications and Applied Mathematics Assessment booklets were disseminated during the September 1990 workshop. The participants at the eighteen pilot sites used assessment items to pretest and posttest each module/unit they taught between September 1990 and May 1991. The participants at each of the eighteen sites were provided with summary answer sheets to record students' scores. They collected and returned the completed answer sheets to the project staff for data entry and analysis.

The Mathematics Achievement booklets were disseminated to the ten selected sites in September 1990. The participants were provided with instructions and computer-scored answer sheets for use during the administration of the test. This test was used as a pre- and posttest for students using the Applied Mathematics materials and for their comparison group counterparts. The pretest was administered in September and October of 1990. The posttest was administered in May 1991. The test was administered to approximately two hundred thirty students in the CORD Applied Mathematics and traditional mathematics courses. During data collection, the project staff worked with an assessment consultant from the student assessment section of the Illinois State Board of Education.

LIMITATIONS

Because of the nature of the demonstration sites selection, the results should not be construed as generalizable or representative of all schools, students, or programs in Indiana. In most cases, teachers were selected on a competitive basis because of a strong demand for participation as demonstration sites. Given the limited resources available, comparison classes were matched as uniformly as possible on selected variables to the experimental classes when comparing results.

FINDINGS

SAS (Statistical Analysis System) programs were developed to match student demographic data with student pretest and posttest data so that statistical analyses could be conducted for the selected variables. Additional qualitative data was also obtained from on-site visits, teacher notes, personal interviews, and small group sessions at four statewide inservice workshops.

The data analyzed to date includes the results from the pre- and posttesting of the norm-referenced mathematics test. The seven goals identified in Table 1 were matched to the test questions. The outcomes for each of the twenty-two units in Applied Mathematics have also been matched to these seven goals. This matching of outcomes allowed the researchers to generate detailed information concerning the changes in test scores and the Applied Mathematics units taught. As shown in Table 2, both of the control and experimental groups made gains between pre- to posttesting (+3.02 for the control group and +7.06 for the Applied Mathematics group). As noted, the Applied Mathematics (experimental) group had more than twice the gain of the control group. The Applied Mathematics group outperformed the control group in all but one of the seven goal areas. That goal was the first, which emphasized addition, subtraction, multiplication, and division.

If a gain score of five percent or more is considered significant, then the Applied Mathematics group had statistically significant gains with respect to five of the seven goals. The control group made significant gains with respect to two of the seven goals. The control group reported the greatest gain (+7.60) in the fourth goal, which deals with identifying, analyzing, and solving problems using algebraic equations, inequalities, functions, and function graphs. It should be noted that the Applied Mathematics group gained 9.84 points in this area. The Applied Mathematics group reported their greatest gain (+10.22) with respect to the fifth goal, which deals with to understanding and applying geometric concepts and relations in a variety of forms. The control group made a gain of 5.12 on the fifth goal.

The researchers are continuing to analyze data on applied academics materials; therefore, the findings discussed in this preliminary report are restricted to the statewide pre- and posttest results from the normed mathematics test. Additional findings and conclusions will be analyzed and summarized in the second phase of the project, July 1, 1991, through December 31, 1991. In addition, these data collection instruments have been disseminated to a number of other states for use. As researchers in other states analyze and summarize their data, the researchers will attempt to compare results from these various efforts in order to strengthen the findings and conclusions.

Table 1

Goals Used by the State of Indiana in Mathematics

GOAL 1:	As a result of their schooling, students will be able to perform the computations of addition, subtraction, multiplication, and division using whole numbers, integers, fractions, and decimals.
GOAL 2:	As a result of their schooling, students will be able to understand and use ratios and percentages.
GOAL 3:	As a result of their schooling, students will be able to make and use measurements, including those of area and volume.
GOAL 4:	As a result of their schooling, students will be able to identify, analyze, and solve problems using algebraic equations, inequalities, functions, and their graphs.
GOAL 5:	As a result of their schooling, students will be able to understand and apply geometric concepts and relations in a variety of forms.
GOAL 6:	As a result of their schooling, students will be able to understand and use methods of data collection and analysis, including tables, charts, and comparisons.
GOAL 7:	As a result of their schooling, students will be able to use mathematics skills to estimate, approximate, and predict outcomes and to judge reasonableness of results. (p. 3)

Source: Illinois State Board of Education, Department of School Improvement Services. (1986). *State Goals for Learning and Sample Learning Objectives for Mathematics*. Springfield, IL: Author.

84

Table 2

Results of Mathematics Achievement Assessment in Indiana

Mean Test Scores for Control Group

		Pretest (n = 158)	Posttest (n = 95)	Change
Goal	1	44.28	48.40	+ 4.12
	2	45.28	39.80	– 5.48
	3	34.86	37.60	+ 2.74
	4	35.00	42.60	+ 7.60
	5	51.28	56.40	+ 5.12
	6	62.00	65.20	+ 3.20
	7	43.71	47.60	+ 3.89
Group		45.20	48.22	+ 3.02

Mean Test Scores for Applied Mathematics Group

		Pretest (n = 280)	Posttest (n = 174)	Change
Goal	1	49.55	51.75	+ 2.20
	2	45.11	51.50	+ 6.39
	3	39.33	48.50	+ 9.17
	4	41.78	51.62	+ 9.84
	5	50.22	60.50	+ 10.28
	6	61.11	68.25	+ 7.14
	7	51.88	56.25	+ 4.37
Group		48.42	55.48	+ 7.06

CONCLUSIONS

The data indicates that the Applied Mathematics curriculum materials enable students to perform at higher academic levels across a broader range of skill areas in mathematics than traditional materials do. The Applied Mathematics curriculum enhances student performance in areas identified as essential by the National Council for Teachers of Mathematics. These results are very similar to those found in Illinois during the 1989-1990 school year. Additional data analysis needs to be completed on students and teachers to more accurately define the program and student characteristics which made up the experimental and control groups. These findings need to be compared to research in other states that have used similar instruments and procedures.

REFERENCES

Bryk, A. S., & Raudenbush, S. W. (1988). Toward a more appropriate conceptualization of research on school effects: A three level hierarchical linear model. *American Journal of Education*, *97*(1), 65-108.

Illinois State Board of Education. (1986). State goals for learning and sample learning objectives for mathematics. Springfield: Author.

U.S. Department of Education, & U.S. Department of Commerce. (1988). *Building a quality workforce*. Washington, DC: U.S. Department of Labor, Office of Public Affairs.

APPENDIX A

APPLIED MATHEMATICS DEMONSTRATION SITE DESCRIPTIONS

J. E. Light Career Center, Indianapolis

Applied Mathematics is infused as the course content for General Math 3 and 4. General Math 3 and 4 are math courses offered for math credit and taught by a licensed math teacher. Targeted enrollees are vocational and nonvocational students who had not previously been successful in math. A general math class at North Central High School served as the control group. Applied Mathematics instructional content is also fused into some vocational programs. At the request of vocational teachers, selected Applied Mathematics units are being integrated into vocational programs to enhance specific math skills. No math credit is awarded when only a few selected math units are integrated into a vocational program. Dr. Eldon Horton, Vocational Director, is the contact person.

Blue River Vocational Technical Center, Shelbyville

Applied Mathematics instruction is being fused one to three hours weekly in the building trades and machine trades programs to enhance students' math skills. Applied Mathematics instruction is being provided by building trades and machine trades teachers, and no math credit is being given. Mr. Robert Hoffman, Vocational Director, is the project contact person.

Delphi High School, Delphi

The general math (ninth grade) curriculum is being replaced with Applied Mathematics instructional content. General math is being taught by a licensed mathematics teacher and math credit is being awarded. A separate general math class is serving as the control group. Mr. Robert Tyner, Mathematics Department Head, is the contact person.

Elkhart Memorial High School, Elkhart

The Math 1 and 2 (ninth grade) curriculum is being replaced with Applied Mathematics instructional content. Math 1 and 2 courses are being taught by a licensed mathematics teacher and math credit is being awarded. Mr. Jim Mayes, Math Department Head, is the project contact person.

Elkhart Area Career Center, Elkhart

Two Applied Mathematics are offered, one in the morning and one in the afternoon, for vocational students needing math credit. Students are pulled out of their three-hour vocational program for one hour daily. Students receive one math credit and two vocational credits for the three-hour block of time. Applied Mathematics is taught by licensed math teachers. Mr. Clyde Riley, Program Director, is the project contact person.

New Castle Area Vocational School, New Castle

Applied Mathematics instruction is provided three hours weekly (on Monday, Wednesday, and Friday) in the vocational welding program. Applied Mathematics instruction is provided by a licensed math teacher, but no math credit is given. Additionally, the shop math curriculum is being replaced with Applied Mathematics instructional content. Shop Math is taught by a licensed math teacher, and math credit is awarded. Mrs. Beverly Hankenhoff, Vocational Education Director, is the project contact person.

Seymour High School, Seymour

The Consumer math (grades nine through twelve) curriculum is being replaced with the Applied Mathematics instructional content. Consumer math is being taught by a licensed math teacher and math credit is given. A separate consumer math class is serving as the control group. Mr. Jerry Finley, Curriculum Director, is the project contact person.

South Vermillion High School, Clinton

The Math 1 (ninth grade) curriculum is being replaced with Applied Mathematics instructional content. Math 1 is being taught by a licensed math teacher, and math credit is given. A separate Math 1 class is serving as the control group. Mr. Jerry Hawkins, Vocational Education Administrator, is the project contact person.

Upper Wabash Vocational School, Wabash

An Applied Mathematics course is offered to juniors and seniors who are enrolled in vocational programs and who need math credit. Students are pulled out of their three-hour vocational program for one hour per day to take Applied Mathematics. Students receive one math credit and two vocational credits for their three-hour block of time at the vocational school. Mr. Robert Plunkett, Principal, is the contact person.

Wabash High School, Wabash

The General Math II (second year math) curriculum is being replaced with Applied Mathematics instruction content. The course is being taught by a licensed math teacher, and math credit is awarded. A separate General Math II class is serving as the control group. Mr. Neal Pedro, Vocational Education Director, is the contact person.

INTEGRATION OF OCCUPATIONAL AND ACADEMIC EDUCATION: ILLUSTRATED USING INTERIOR DESIGN VIGNETTES

Thomas D. Sepe
Mercer County Community College

Dorothy Miller
Harford Community College

Margaret Wylie
Harford Community College

Academic tradition has produced a history of specialization, separation, and compartmentalization. This is illustrated most fully in our traditional approaches to curricula. At a time when both internal and external demands are rising for student competence in both occupational and fundamental academic skills, better coordination and integration is essential.

A model for a holistic curriculum which integrates academic and occupational courses begins with the identification of the goals or outcomes of general education. With this list elaborated into competency statements, the general education component is constructed as a core or distribution of courses which clearly addresses these goals. The selection and organization of general education courses is built on the premise that general education is a "curriculum within a curriculum." It is also recognized that the limited space available in occupational curricula does not allow for mastery of the general education goals. At best, these courses provide a foundation or minimal level of competency in achieving the general education goals.

Assuming that the occupational course sequence is systematically organized, competency based, and successfully achieve its stated outcomes and further assuming that no additional space exists to enlarge the general education component, the need to integrate these aspects into the curriculum becomes apparent. The model for integrating occupational and academic components is based on two processes. First, the model utilizes the "across the curriculum concept" to integrate all general education competencies and is most typically found in "writing across the curriculum." These competencies, first acquired in academic courses, must be reinforced, generalized, and expanded in occupational courses. This is essential for students to achieve mastery by the end of their educational experience. The second process is the use of systematic approaches to curriculum development, such as DACUM and curriculum mapping, to identify and specify the location and distribution of both occupational and academic competencies across courses in a curriculum.

In the final analysis, this systematic, holistic curriculum model produces a more unified and coherent program of study for the student and provides greater probability of academic and occupational mastery. For the faculty, it provides a concrete process of exchange across disciplines and departments and focuses on the competencies a graduate should possess as a unifying purpose for all curricula, occupational and academic.

A GENERAL EDUCATION MODEL

The faculty at Harford Community College subscribes to a two part commitment to general education: commitments to the core requirements of the curricula and to the inclusion of general education goals and experiences in all courses. To help focus the faculty's expectations of students, five general education goals have been identified and are published in the college's catalog. The goals require students to (1) communicate more effectively using language and numbers or symbols; (2) develop critical thinking skills through problem solving and other methods appropriate to a number of academic disciplines; (3) evaluate issues in light of artistic, intellectual, social, economic, political, and scientific heritage; (4) develop skills and attitudes that promote physical and psychological health; and (5) function more effectively as a citizens in a democratic society.

To provide an integrated educational experience, all general education courses (except physical education) must contain several of the following experiences: (1) a variety of written assignments; (2) opportunities for discussion and/or oral presentation; (3) exercises that require students to use problem solving and/or decision-making theories unique to a given discipline; (4) exercises that require computation skills and/or scientific reasoning; (5) written or oral assignments in which students evaluate issues in light of their artistic, intellectual, social, economic, political, or scientific heritage; (6) exercises which develop skills or knowledge that enable students to appreciate their own and other cultures and to participate more effectively in a democratic society; (7) exercises which use resources beyond classrooms, including libraries and computers; and (8) physical education courses emphasizing activities that students can use throughout their lifetime.

THE GENERAL EDUCATION CORE

To be eligible for the Associate in Arts degree, students must have completed a minimum of sixty-two credit hours of college-level work, including twenty-seven credit hours in general education. Students are required to adhere to the distribution of courses in Table 1. Specific lists of courses that satisfy the distribution requirements have been developed and are published in the college catalog. Humanities offerings include art, drama, interdisciplinary humanities, literature (including Spanish and French literature), music appreciation, and philosophy. Mathematics requirements are primarily algebra based with a few exceptions for business and elementary education programs. All students are expected to complete a laboratory science course and may select from courses in astronomy, biology, chemistry, physics, earth science, or physical science. In the social and behavioral sciences, students elect courses in anthropology, economics, geography, history, political science, psychology, and sociology.

To be included in the general education core, a course must meet a majority of established guidelines. It must (1) be an introductory course to a recognized discipline, (2) emphasize breadth in a discipline rather than depth, (3) have no college-level prerequisites, (4) carry three credits (laboratory science courses must total four credits), and (5) be widely accepted for transfer at the institutions to which Harford's students transfer in large numbers. One unique feature of this model is the opportunity to take courses which do not have a discipline designation traditionally associated with general education in order to meet a general education distribution requirement. Conversely, not all courses in disciplines traditionally associated with general education will meet the general education requirements.

Faculty in each discipline are responsible for developing assignments that address appropriate general education goals for each course they teach. Course outlines for courses in Table 1 indicate which assignments and class experiences are designed to foster the goals of general education. Within divisions, deans are responsible for periodically reviewing course outlines with the faculty in each discipline to discuss the ways in which goals are being implemented. When curricula are being proposed or revised, special attention is given to established procedures for reviewing the general education component. These include the academic integrity of the program, flexibility of course selection within the general education core, transferability, program certification and accreditation requirements in areas such as nursing, and the special requirements of a senior institution after which Harford Community College's program was patterned.

Table 1

General Education Credit Hours Required for Associate in Arts Degree

Course	Credit Hours
ENG 101 – English Composition	3
Humanities Survey Elective*	6
Math, Natural Physical Science	10
Social/Behavioral Science	6
Physical Education**	2

* In some technical programs, such as nursing, students may elect to substitute three credits of technical writing for three credits of humanities survey elective.

** This includes either two credits of fitness maintenance or one credit of fitness maintenance and one credit of activity.

Although the distribution model for general education is not unique, the faculty considers the integration of general education into the total curriculum to be an exemplary feature of Harford's model. This integration is accomplished with writing across the curriculum, the identification of relevant general education goals, and the inclusion of several of the prescribed experiences in the classroom methods. One example of this integration may be seen in the following description of the use of lighting vignettes for interior design.

A CLASSROOM EXERCISE

To create effective spaces, interior designers need to provide the mood and atmosphere a client desires. They must be able to predict and specify with certainty the furnishings, materials, colors, and lighting which will assure that elusive element, satisfaction.

A lighting course involves technical knowledge and requires creative applications of that knowledge. For example, students should understand differing terminology including (1) what a lumen, watt, and foot-candle each represents or measures; (2) how to select a light source (i.e., either incandescent lamps, which include halogen and low voltage lamps, or gaseous discharge lamps such as low or high pressure sodium, fluorescent, or metal halide lamps); and (3) what the optical characteristics, electrical efficiency, and color rendering of each lamp are. However, merely identifying these terms or describing processes does not begin to challenge students to apply the information in creative ways. Moreover, as time passes, specifications change as new materials are introduced into the marketplace, and students will be required to assess those materials' relative merits in their workplace. How, then, can an instructor encourage experimentation and creativity in the classroom, nurture student confidence, and assess students' success with lighting in an area where there is little budget for lighting equipment? One workable method is the use of lighting vignettes.

One Experience

An exercise of student groups creating lighting vignettes in the classroom evolved to address some of the concerns expressed by students. Concerns involved application of book knowledge to working models and accuracy in judging what a space will actually look like from a lighting plan. As an instructor, I could tell them, "Yes, I really think so," or "Perhaps it's too overlit here," or "Maybe the foot-candles need to be increased in this area of primary brightness or where you have this sculpture highlighted." Listening to the students' concerns encouraged me to bring to class a variety of lighting sources and accessories to illustrate the principles I had taught. Initially, I told students to "play" with these materials and see what happened. I wanted them to discover the scope of their own creativity in developing special lighting effects. From these informal learning situations, I developed the formal lighting vignettes which permitted both creative expression on the part of the students and a structured experience which I could assess consistently.

Students were graded according to each group's success in using the compositional techniques of achieving areas of primary and secondary brightness and using a "touch of magic." These compositional techniques include those in Table 2.

Table 2
Specific Lighting Techniques Used to Achieve Primary and Secondary Brightness

1. Highlighting—An object is lit with five times the amount of brightness of its background, draws attention, and affects where people will sit and move through a space.
2. Wallwashing—A wall is lit uniformly to unify various objects mounted on it or to flatten its texture.
3. Beam play—Clear glass lamps or gobos (stencils which are placed in lighting fixtures) allow the shape of light beams to form patterns on a less brilliant surface.
4. Shadow play—The shapes of shadows form patterns on a more brilliantly lit surface.
5. Silhouetting—An object is placed in front of a brightly lit area so that only its silhouette is seen.
6. Backlighting—A light source is placed behind a translucent material which diffuses and holds the light and allows it to become luminous.
7. Structural lighting—Lighting is mounted or custom built into furnishings or architectural constructions such as beams and cornices.
8. Downlighting—Overhead light is used to emphasizes horizontal surfaces.
9. Uplighting—A low source of light is directed up to emphasize a higher point of interest.
10. Grazing—Overhead or uplighting is placed close to a vertical surface to emphasize the texture of that surface.
11. Sparkle—Tiny light sources are used to add a festive atmosphere to the environment.
12. Light as art—Luminous art is created from varying light sources and forms.

Instructional Methods

One week before the vignettes are to be presented, the project is assigned. Students form groups of three or four to brainstorm ideas and to identify materials and props as they plan lighting vignettes of their choosing. Students incorporate the goal of writing across the curriculum by completing a written design statement. Design statements might state, "The purpose of this exercise is to create a romantic dining atmosphere for Susan and Todd Matthew's third wedding anniversary in their home in Bel Air," or "The purpose of this exercise is to use lighting as a means to attract people and draw them into a travel agent's office in the Harford Mall."

Completing a written design statement promotes the development of group problem solving and communication skills which are basic to the practice of interior design. It satisfies the general education requirement of having opportunities for discussion and oral presentations, and offers exercises that meet the goal of requiring students to use problem solving and decision making theories unique to the discipline. At the end of this initial planning session, each student is given a note card on which to write each group member's name and telephone number. This ensures ease and accuracy of communication outside of class. When students leave the class, each group hands the instructor a card on which is written group members' names and the group's design statement.

Subsequently, students work outside of class; during a second class period they work on the next steps in the design process, research and programming. The activities, needs, and requirements of their hypothetical clients and any external factors affecting the design are researched, analyzed, and written as a program that directs the design solution. During the design development phase, students brainstorm ideas and select the best idea for implementing the design, expanding their experience with general education goals.

On the day of the presentation, students bring their materials, props, and lighting fixtures to create their vignette. Each group makes an oral presentation to the class and is critiqued by a member of another group. Innovation in these group projects has generated a "touch of magic" in the past. The classroom has been transformed as whiteboards were draped with fabric to resemble wallcovered backgrounds. Wallpaper borders have been stapled to bulletin boards to provide wall treatments for a traditional formal foyer and bedroom. Desks have been arranged in an L-shaped grouping to simulate a kitchen with an aluminum foil oval representing the sink, and metal graters sprayed a coordinating peach color have served as lighting fixtures over "the counter." A brocade Chinese kimono has been suspended from a metal ceiling grid at an appropriate height to frame a sushi bar in a New York apartment. The silk ficus tree from the instructor's office has done quadruple duty as a prop for a variety of lighting techniques, including uplighting, shadow play, and a "touch of magic." In addition, a silk rug from Persia, spotlit with red-orange colored lighting and uplit ficus trees, transformed the foyer of the classroom building into an exotic environment for a travel agency office.

Recommendations

Vignettes may easily be adapted to other activities in the interior design curriculum. In fact, this lighting exercise is a spin-off of an original classroom exercise in creating an accessory grouping for an introduction to interior design course. This type of exercise is particularly well-suited to the re-entry student who typically takes the interior design courses at a community college. These students often have experience in decorating a home and have many more resources to call upon than do the traditional college-age students. The enthusiasm and confidence generated for the exercise a year ago by first-year students still exists. As one student stated, "Lighting is really exciting, and I'm conscious of its effects everywhere I go." This enthusiasm revealed itself in the extra research, in the attention to detail and pizzazz shown in their projects last semester, and in the excitement they express as they describe what they have done in their own homes and in other interior environments. It has become a love affair students say they will never relinquish.

SECTION III
PROFESSIONAL DEVELOPMENT OF OCCUPATIONAL/TECHNICAL FACULTY

HUMAN RESOURCE DEVELOPMENT FOR HIGHER EDUCATION AND INDUSTRY

Lowell D. Anderson
Robert E. Croker
Ivan V. Simmons
Indiana State University

INTRODUCTION

The Industrial Technology Education (ITE) Department at Indiana State University (ISU) sought approval from the Indiana Commission for Higher Education to offer both a baccalaureate and a master's degree in Human Resource Development for Higher Education and Industry. Approval was granted in May of 1990, and the program became available over the Indiana Higher Education Telecommunication Systems (IHETS) to the thirteen regional campuses of the Indiana Vocational Technical College (IVTC) System and at various industrial locations. This alternative delivery method of instruction began in the fall of 1988. This system has proven to be effective in reaching those learners who previously were unable to attend classes at a university campus. Approximately seventy classes were offered over this system in the fall of 1991. In addition, numerous conferences and other special broadcasts have been aired.

This project was an immense undertaking for a department which had historically been involved in vocational trade, technical education, and industrial arts. Changes involved redesigning key degree components, writing more than thirty new courses, developing a communication network with the IVTC system for receiver stations, promoting the program, and preparing faculty to become effective users of television as a new technological medium.

Human resource development (HRD) was defined as "organized learning experiences provided by employers within a specified period of time to bring about the possibility of performance improvement and/or growth" (Nadler & Nadler, 1989, p. 6). Components of this and similar definitions assisted in the preliminary planning for the degree program. Selected components reinforced the concept of training as a critical and legitimate part of an HRD degree program.

IHETS was developed as a one-way video, two-way audio system. The instructors could only see those learners present in the classroom during the broadcast and had to become accustomed to only hearing other students. This situation did not reduce interaction among students, however. Lively discussions continued between classroom students and students participating at remote sites. Any audio transmission was heard by everyone, regardless of location.

PROGRAM PRELIMINARIES

Two pieces of information were needed prior to developing the program: (1) information about the scope and needs of the potential market and (2) structure of course and degree programs. The department obtained information by developing an advisory committee composed of key representatives of IVTC and by completing an extensive feasibility study. The advisory committee was essential in gaining support for the delivery system and approval of the degree program. Early in the process, it was decided that the program would address staff development for current faculty at IVTC and currently employed industrial personnel. This second population was ultimately not addressed, however, because of problems with identifying such personnel and obtaining information about the roles played by industrial trainers.

The feasibility survey was sent to all faculty in the IVTC, but responses were primarily from full-time faculty. The survey was delivered to 1,756 faculty members. Information used was from one hundred seventy-nine full-time faculty, who represented thirty-three percent of the total five hundred fifty members. Critical information obtained through the survey included (1) demographic characteristics, (2) educational background, (3) subject matter specialties, (4) pedagogic skills, (5) professional development goals, and (6) characteristics of an acceptable delivery system. The combined information gained from the feasibility study and the advisory committee was used extensively in the program and delivery system design.

RESEARCH

The purpose of the research was to determine the attitudes toward that delivery system of students who have taken IHETS courses. Research questions addressed whether (1) students perceived the IHETS delivered classes to be a viable alternative to traditional off-campus classes, (2) participation in IHETS classes compare favorably with other delivery systems, (3) participants perceived their relationship with the instructor and the institution as being positive, (4) males perceived their experiences in IHETS courses differently than females, and (5) the place of employment significantly affected participants' perception of IHETS classes.

METHOD

A total of sixty-four students have completed one or more IHETS classes. The total population was mailed an opinionnaire with a stamped, return-addressed envelope. Fifty-eight (90.6%) of the opinionnaires were completed and returned.

The Opinionnaire

The opinionnaire was a closed form instrument. Prior to use, the items were given to a group of professors who had experience with test and measurement. The instrument was pilot tested with students who took the IHETS courses on the community college campus. While these students had access to the professor on campus, they had direct exposure to the technology as well. The results of the pilot test were discussed with some of the professors who had offered criticism on the items, and the opinionnaire was refined.

When the data from this study was reduced and analyzed, a coefficient was determined for stability over item samples and parallel forms for the opinionnaire. The correlation coefficient between the two forms was 0.84. The estimate of internal consistency using Cronbach's Alpha was 0.90. A split-half method was also used to determine internal consistency. The scores on the odd-numbered items were correlated with the scores on the even numbered items. The reliability coefficients between the groups was 0.93 using the Spearman-Brown prophecy formula. The Cronbach Alpha for consistency within groups was 0.80 for even items and 0.82 for odd items.

FINDINGS

When comparing IHETS delivery to the traditional delivery of field-based classes, 87.0% of the students perceived the IHETS classes as a positive alternative delivery system. 96.0% percent of the respondents believed that the IHETS classes should be continued, and 70.4% reported that accomplishing their educational goals depends on the IHETS delivery system.

Participants compared their experiences in IHETS classes favorably with other classes. Most (77.2%) reported that the IHETS delivery system provides learning experiences and feedback equal to other classes. Eighty-two percent of the respondents reported that they were encouraged to participate in class discussion. Nearly one-half of them believed, however, that interaction between the instructor and student, and between student and student was not equal to other classes and needed to be improved.

Generally, the students (94.7%) reported that a positive relationship existed among IHETS students, the instructors, and the institution. Students (76.4%) also reported that they received excellent instruction and that the IHETS instructors did a good job. 93.0% of the respondents reported that they were treated as well or better by IHETS instructors than in any other classes, and 87.8% believed that IHETS students are satisfied with the delivery system. Of those students who responded, 96.0% percent believed that the IHETS classes should be continued.

On many of the items, males and females perceived their IHETS class experiences differently. Also, participants who had taken one course perceived their IHETS classes differently from participants who had taken two or more courses. Ivy Tech students perceived their IHETS experiences differently than did secondary education students, industry representatives , and other participants. The data did not support a conclusion that the distance participants had to travel to a field-based class affected their perception of the class.

DEGREE PROGRAMS

The following definition was used for structuring the degree program at Indiana State University (1990): "The purpose of the Human Resource Development program for Higher Education and Industry is to prepare professionals for higher education, industry, business, government, and other agencies who are competent to conduct, plan, and manage education, training, and other human resource development activities" (p. 2).

The bachelor of science degree required one hundred twenty-eight semester credits. Seventy-eight of the credits were required in the major and fifty in basic and liberal studies. The major required (1) thirty credits in the professional core, (2) twenty-eight credits in previous occupational/life experience or college level technical preparation, and (3) advanced technical specialization at the 300 and 400 level for a four-year degree granting institution.

The master of science degree required thirty-three semester credits. Eighteen of the credits were required to come from within the department, and were specified according to the approved degree program. Three credits were required in research. The option of specialization within the HRD model was strongly supported. A student was able to incorporate twelve credits from other areas of study into the degree program, and a research thesis might have been selected as one option within the program. Two unique features of the program were the requirements of an internship experience in an industrial setting and a major project involving applied research.

Internship or industrial experience was emphasized throughout the program. This combination helped to ensure that students entering the program had considerable experience beyond the high school. A cross-section of the student population revealed that nearly one hundred percent were employed, students' average age was over thirty-five, and all had the additional responsibilities of family or related roles. All were part-time students.

THE CLASSROOM SITUATION

With some students not being visible, a challenge was presented to the instructor. Methods of questioning needed to be developed to ensure that all students participated and understood. Instructors needed to note mentally or physically who had and had not participated. Physical cues such as sleeping and puzzled looks no longer alerted an instructor to comprehension problems. Therefore, an instructor's direct questions assisted him or her in determining whether the material was being understood.

The use of visual aids changed little. The system used by ISU for overhead projection picked up the image from a master rather than a transparency. Hence, the system saved on production costs and accomplished the same job as an overhead. This technology also facilitated the use of printed material, texts, and journals directly from their source. This same system also allowed the instructor to write as on a chalkboard.

Other classroom media were also accommodated on IHETS. Slides were projected directly onto the monitor screen. Sound films and videotapes were also used. Anything that could be used in a traditional classroom could be used on IHETS. In fact, some IHETS features even improved classroom delivery. With close-up camera abilities, an operation or a part that might have been too small to be successfully exhibited to students without passing it around could be seen by all at the same time.

Testing did not present a problem either. It only needed to be planned well in advance. Methods that have proven successful did not vary much from those used in a traditional classroom. Take home tests were popular with one faculty member, while others used open book/note tests. The method most used, though, was that of proctored examinations. Each IHETS downsite was located at an institution that had available personnel for proctoring tests or quizzes and that provided the names of individuals willing to proctor an examination. Faculty members could then contact the potential proctor directly. In the two-year institutions, proctors were usually supervisory personnel in industry or department chairs.

SUMMARY

The ITE department began using IHETS in the fall of 1988 with one class. In the spring of 1989, two classes were offered. The following fall, four classes were offered; in the spring of 1992, six classes will be offered each semester using this delivery method. This delivery method is serving teachers, postsecondary faculty, and industrial trainers with classes they need but are unable to attend directly. The unique features of the programs and the use of alternative delivery have served to promote considerable growth in the department. Travel time for faculty has also been significantly reduced. In addition, the college has participated in what will prove to be a prominent delivery method of the future. Many colleagues have viewed alternative, electronic delivery skeptically. Of those, many have had to re-evaluate their thinking after the success of this program. The Carnegie Commission on Higher Education forecast that by the year 2000, twenty percent of instruction in higher education will be electronic. Because of the success of this program, the university will not be on the outside looking in as this curriculum technology develops.

REFERENCES

Nadler, L., & Nadler, Z. (1989). *Developing human resources*. San Francisco, CA: Jossey-Bass.

THE GEORGIA INSTRUCTOR ACADEMY

K. Brent Askins
Michael J. Galloy
Valdosta State College

Many reports have called for improving the quality of the nation's instructors. *Tomorrow's Teachers* (Holmes Group, 1986) endorsed a five-year preservice program, levels of professional staffing, and national testing as ways to ensure better instruction. *A Nation Prepared: Teachers for the 21st Century* (Carnegie Forum on Education and the Economy, 1986) was similar to the Holmes Group report and additionally called for creation of a National Board for Professional Teaching Standards. The board would provide assessment of both pedagogical skills and instructional content. Other reports and groups indicated that change is needed in instructor preparation. Furthermore, *A Nation at Risk: A Call for Change in Teacher Education* and reports from the Southern Regional Education Board and the National Governors' Association indicated a need to assess preservice and inservice teacher preparation (Robbins, 1988). All of these reports addressed issues germane to general teacher education; none, however, gave particular attention to improving preparation of technical instructors' subject matter. Improving the quality of technical teachers requires a three-fold initiative. First, they must be occupationally adept in their technical areas of expertise. Second, they must be foundationally sound in pedagogical practices. Finally, technical instructors must be encouraged to become consummate professionals.

Various states in the Southeast are addressing these issues through various efforts. Virginia, Kentucky, Louisiana, Mississippi, and Georgia all have joint ventures between colleges and state departments of education to meet a variety of needs exhibited by technical teachers. Each of these states has some kind of "new teacher" workshop. States also have a diversity of inservice activities designed to enhance the effectiveness and efficiency of practicing instructors. These inservice activities have been effective in the past but currently are under scrutiny to determine if cost is equivalent to services received. The Georgia Department of Technical and Adult Education (GDTAE) is endorsing an initiative to unify inservice offerings through a clearinghouse-type arrangement. GDTAE believes it can centralize information, increase access, and control quality using a teacher-centered model (Kohl, 1989). This concept has been named the Georgia Instructor Academy

(GIA). The purpose of the GIA initiative is to provide staff development activities to enhance the quality of instruction delivered at the technical institutes. Before GIA could become functional, however, significant changes in the state's postsecondary technical education system had to be made.

PROGRAM STANDARDS AND CURRICULUM GUIDES

In 1985, Georgia created the Georgia Board of Technical and Adult Education (GBTAE). The governance and direction of the state's technical institutes were legislated to this board. In 1986, GBTAE began the monumental task of establishing statewide, program-specific standards and curricula that reflected current job practices. Technical committees comprised of representatives from industry, state agencies, and technical institute instructors met to determine content, instructional sequencing, and overall program design (Stonehouse, 1990). As various program standards and guides were completed, they were disseminated to all the institutes offering the respective programs. Implementation has been phased in as materials have become available. Currently, sixty-five program standards and curriculum guides are completed. The GDTAE has exhibited its faith in the new curricula by issuing a guarantee on the quality of Georgia's technical programs' graduates.

THE GUARANTEE PROGRAM

The "Technical Education: Guaranteed" program began in 1989. The GDTAE has developed curriculum standards with the direct involvement of business and industry. These standards will serve as the industry-validated specifications for each occupational program. The guarantee states, "If one of our graduates, who was educated under a standard program, and his/her employer agree that the employee is deficient in one or more competencies as defined in the standards, the technical institutes will retrain that employee at no instructional cost to employee or employer" (GDTAE, 1990).

A study by Bobell and Reeves (1990) indicates that institutes, instructional staff, students, and industry view the guarantee program as a positive indicator of technical education quality. This initiative and those mentioned previously were implemented statewide through administrative efforts, but input was needed from instructors in the field. In response, the state was divided into regional districts that provided local institute instructional staff with access to the decision-making processes.

CONSORTIUM DEVELOPMENT

The northern, central, and southern regions of the state were each divided into eastern and western sections. The five or six technical institutes in each of the sections formed a consortium that dealt with the instructional needs of their region. Program specific committees were formed with representatives from every institute in that consortium. Each committee elected a chairperson to represent its respective consortium on the state executive committee. The end result was the Instructional Faculty Consortium Committee (IFCC), which provided all instructors with a channel to voice their programmatic concerns at institutional, regional, and state levels. One of the IFCC's major tasks has been to modify standards and curriculum guides to reflect regional occupational needs. Future efforts will focus on keeping curricula up to date and relevant. Now that the curricula and administrative restructuring efforts are complete, the state can turn its efforts to enhancing the quality of its technical instructors.

THE GEORGIA INSTRUCTOR ACADEMY

Conceptually, it would be best if technical instructors were trained through traditional instructor education programs. In many cases, however, instructors in technical, trade, and industrial subjects have had no collegiate instructor preparation program available to them. Although real-world experience may be the greatest teacher, even the most competent practitioner is not a teacher unless that person's knowledge and skills can be passed on to students. It is equally important that practicing instructors keep abreast of technical advancements and their own professional development. The GIA is responsible for delivering inservice training to both new and experienced instructors. The Academy is divided into three specific divisions as follows: (1) technical training, (2) professional development, and (3) the Instructor Training Institute. Each division addresses specific needs of Georgia's technical institute instructors (Kohl, 1989).

TECHNICAL TRAINING

The Technical Training division provides instructors with opportunities to advance their occupational expertise. Past collaborative efforts with industry were primarily aimed at enhancing opportunities for students, but it is equally important for instructors to remain technically adept. Georgia has standardized curricula to keep up with workplace requirements, but instructors must also be kept current. Most of the resistance to technical changes has come from experienced instructors, who often find their technical skills and knowledge outdated.

The technical competence of new instructors is also an important issue. Many times the breadth of occupational experiences brought to the classroom is not enough to encompass all the curriculum requirements. Most new instructors in Georgia's technical institutes are job oriented rather than occupationally oriented. Job orientation denotes skills required for a job an individual had prior to becoming an instructor. These skills are often limited to a specific area of an occupation and are not broad enough for the technical expertise required by occupational standards. Occupational orientation refers to the large number of technical competencies encompassed by an occupational title. Students need experiences in all competencies identified by program guides, and quality instructors should be able to deliver instruction in those areas. Training and updating opportunities for technical instructors can come from a variety of sources. Industry-sponsored workshops and seminars designed for industry personnel are often run at less than capacity enrollment. Technical institute instructors could fill the empty slots. Additionally, industry can sponsor programs directly for instructors. Other efforts may include joint ventures between the GIA and industry with industry partners providing technical expertise and GIA personnel directing instructors to incorporate newly learned competencies into existing curricula. Lastly, activities such as job shadowing and internships in local industries could be arranged and organized through the GIA.

PROFESSIONAL DEVELOPMENT

A major problem facing Georgia's technical institutes is turnover. Instructors who do not experience the intrinsic professional rewards of teaching are most likely to leave the profession. They are often our brightest and most promising instructors. The Professional Development Division of the GIA will provide instructors with opportunities to enhance their professional lives. Through classes, seminars, and workshops, technical instructors will learn about opportunities that provide service to self, home institutes, communities, and professional organizations. Professionalism in teaching depends on providing instructors with opportunities to (1) contribute to the development of knowledge in their profession, (2) form collegial relationships beyond their immediate working environment, and (3) grow intellectually as well as professionally.

Activities offered through this GIA division will be wide in variety and can occur at the prompting of the instructors themselves. Information about the types of activities needed or requested can be gathered through surveys or by conducting interviews at consortium meetings. Final decisions on GIA activities for this division will be made by an advisory committee selected from technical institute instructors. While developed and organized through the GIA, programs will not be delivered at one central location. The ideal place for delivery is in the consortium region. It is possible that more than one of the six consortia may be brought together for a particular program. Instructors will be provided with opportunities to leave their home institute and exchange ideas with their colleagues. Additionally, this practice will keep travel expenses to a minimum because activities will be conducted within commuting distance of participating institutes. A variety of sources will be tapped to conduct these activities, including college faculty, state department personnel, and private consultants. Technical institute instructors with an interest or expertise in a particular subject are often an overlooked resource for their colleagues. Professional development of technical instructors will enhance personal images, increase awareness of their important role, and help them understand technical education's value to society.

THE INSTRUCTOR TRAINING INSTITUTE

The quality of instruction provided through Georgia's technical institutes is reflective of the capabilities of the instructors. Yet, historically, many states have permitted instructors in postsecondary technical, trade, and industrial subjects to enter teaching without degrees in education. The essential qualification for new instructors to teach occupational courses is their technical expertise. Individuals who have mastered a technology must also develop the necessary knowledge and skills to provide a beneficial learning environment for their students. The idea of recruiting instructors with technical expertise, as opposed to pedagogical training, leaves institutes with instructors who have job-centered work attitudes reflective of industry demands. Job-centered individuals are task oriented and are primarily interested in completing the job at hand. They must be taught to become people-centered as required by education.

The people-centered approach emphasizes training and developing each individual in a classroom, regardless of his/her individual strengths and weakness. The Instructor Training Institute (ITI) provides new instructors with the basic pedagogical skills need for initial survival. It is a three-phase program with each succeeding phase building on the competencies presented previously. It should be noted that the ITI is currently the major thrust of the GIA, and served as the building block from which the other divisions developed. The ITI began in January of 1987 as one of the first initiatives sponsored by the new GBTAE. The goal was to assist in the development and improvement of the instructional competencies of new postsecondary technical institute instructors. Originally, the program was offered at two sites within the state, Americus in the south and Clarksville in the north. In August of 1990, the two programs were brought together to ensure an effective, efficient, and cohesive program.

The ITI format is presented in three phases, each four days in length. A total of twenty-two programs are offered each year, eleven in the first phase, seven in the second phase, and three in the third phase. There is a maximum enrollment of fifteen new instructors in any given phase. This ensures that each participant will receive individual attention. Phase I presents those basic instructional competencies considered essential for initial performance and effectiveness. Topics include developing effective presentation techniques, writing performance objectives, and writing criterion-referenced test items. Phase II teaches intermediate instructional competencies designed to build upon and expand those skills learned in the first phase. Topics include developing effective demonstration techniques, leading student discussions, developing teacher expectations, and assessing student performance.

Phase III presents advanced instructional competencies and topics deemed important by the GDTAE. This workshop could include topics such as multicultural education, special needs students, and the adult as a learner. Instructors are encouraged to complete the entire program within three years. However, most do so in about eighteen months. It is suggested that participants allow six months between phases to implement the skills learned, work out any problems encountered, and try variations of techniques. After six months to a year, instructors return to the next phase with new ideas and questions. Between phases, ITI personnel conduct follow-up visits at participants' home institutes. Visitation allows ITI facilitators an opportunity to evaluate the progress of the new instructors and provides an opportunity to assist instructors with any special problems.

THE COMMUNICATIONS NETWORK

One final component was needed to bring the GIA together as a functioning entity. There had to be a way for instructors, administrators, state staff, and coordinators of the various GIA activities to communicate. Georgia has decided to use a networking system called PSInet, the People Sharing Information network. Because of the diversity of activities planned under GIA direction, there can be no single location housing the academy. GIA required a host computer to serve as a central collection and dispatch vehicle of all academy activities. The purpose of PSInet is to provide a mechanism that links all technical institutes and academy personnel to a bulletin board service that combines activities, schedules, and electronic mail with storage and retrieval of conference documents and other important data. Currently, about one third of Georgia's technical institutes are on-line, with the remaining institutes tentatively scheduled for hookup before 1992.

CONCLUSION

Georgia believes that the quality of the technical institutes is indicated by their graduates who, in turn, are a reflection of the quality of instruction. The responsibility for the students' success as well as of the technical education system as a whole falls directly on the shoulders of the instructors. The GIA can provide various opportunities to develop and enhance the quality of Georgia's technical instructors. By addressing three important areas of teacher development—technical training, professional development, and pedagogy—students, and ultimately the State of Georgia, will benefit.

BIBLIOGRAPHY

Bobell, J. L. V., & Reeves, K. (1990, December). *State of Georgia new technical training warranty program's effects on instructors.* Paper presented at the American Vocational Association Annual Convention, Cincinnati, OH.

Carnegie Forum on Education and the Economy. (1986). *A nation prepared: Teachers for the 21st century.* New York, NY: Carnegie Corporation.

Georgia Department of Technical and Adult Education (GDTAE). (1990). *Technical education: Guaranteed.* Atlanta: Author.

Holmes Group. (1986). *Tomorrow's teachers.* East Lansing, MI: Author.

Kohl, P. (1989, May). *The instructor academy.* Paper presented to the Vice-Presidents Council, Macon, GA.

Robbins, J. H. (1988, August). *The reform movement in teacher education and the prospective teacher of vocational subjects.* Paper presented at the Georgia Vocational Educators Meeting, Atlanta, GA.

Stonehouse, P. (1990). *Technical education as a whole succeeds or fails on the basis of quality instruction.* Report presented to the Department of Technical and Adult Education, Atlanta, GA.

EVALUATING PART-TIME FACULTY

Corrine M. Brown
Hocking College

Faculty evaluation continues to gain support and acceptance as the trend toward accountability focuses on the academic community. Simultaneously, two-year colleges continue to employ many part-time faculty members. As the number increases, the implementation of systematic and integrated evaluation systems for part-time faculty will become imperative.

REASONS FOR USING PART-TIME FACULTY

The use of part-time faculty allows flexibility in course offerings, course scheduling, and off-campus offerings. Part-time faculty typically teach at times that are undesirable to full-time faculty. In addition, there are significant financial incentives for the employment of part-time faculty.

CONCERNS REGARDING USE OF PART-TIME FACULTY

In contrast to the financial advantages associated with the use of part-time faculty, there are also concerns. First, some full-timers view part-timers as contributing very little, if anything, to the institution beyond teaching their courses. Some part-time faculty do not participate in curriculum development, presumably because they have a full-time commitment elsewhere and are generally not interested in such duties. However, curriculum meetings are often held during "normal" working hours, thereby excluding part-time faculty who hold other jobs. If an institution is to take full advantage of its part-time faculty, then it must search for ways to involve part-timers in course development and increase their interaction with full-timers, even if this includes scheduling meetings outside the normal work day.

Little, if any, interaction between part-time and full-time faculty exists in many institutions. In some institutions, the part-timer is committed to using a course outline and syllabus developed by someone else. If material on the syllabus is not covered or is covered differently by the part-timer, there are allegations of poor instructional quality.

CURRENT STATE OF PART-TIME FACULTY EVALUATION

Many institutions administer student evaluations for their part-time faculty, but student evaluations alone do not make an integrated evaluation system. They cannot measure all of the aspects involved in teaching effectiveness. A systematic evaluation procedure contains various components so that evaluation data is gathered from multiple sources.

Some institutions have handled the evaluation of part-time faculty by imposing the evaluation system used for full-time faculty. These evaluation systems do not distinguish the special needs or recognize the unique contributions of part-timers. Full-time evaluation systems are used primarily for promotion and tenure decision, which rarely affect part-time faculty. Common full-time faculty evaluation criteria include performance on committees, publications, presentations, and community service. These criteria are beyond the range of measurement for part-timers. Part-time faculty are employed primarily to teach, thus teaching effectiveness should be at the core of an evaluation system for part-time faculty.

With such a wide range of people, employment conditions, and expectations involved, establishing one policy for all part-time faculty is not logical. Since the motivation for employment differs among part-timers, it is difficult to design and implement one single policy that meets the evaluation needs of the institution. Before part-time policies can be formulated, the institution must define who the part-timers are, what needs they have, and what is expected from them.

Each institution will have to formulate a definition of the "part-time faculty member," one that will be administratively. Since different categories of part-timers exist, it follows that several evaluation systems might be established. However, one underlying concept should always be present. The evaluation system should aim at improving or maintaining existing high levels of teaching effectiveness and defining clear standards of performance for part-time faculty.

METHODS OF EVALUATION

The evaluation techniques most often cited for assessing teaching effectiveness are student evaluation, peer evaluation, department chair evaluation, self-assessment, student learning, growth contracts, and videotaping.

Since many part-timers teach at odd hours and at off-campus locations, videotaping can be a valuable technique for reviewing the classroom performance. Depending upon the teaching experience of the instructor, either one or two taping sessions could be scheduled per term. The department chair or an experienced faculty member would view the tape with the part-time instructor and evaluate classroom teaching techniques. Any suggestions for improvement would be made at this joint meeting, concentrating on the improvement of delivery skills. Videotaping should be used with caution since the presence of a camera in the classroom could cause "stage fright" in both the instructor and the students.

Also, a mentor could be assigned to work with a part-timer. Individual mentors could be assigned, but a senior faculty member could serve in a faculty development role and essentially mentor all faculty.

WHAT SHOULD BE EVALUATED

Part-timers want to teach, and that is the primary reason institutions hire them. The focus of the evaluation system for part-timers should be on teaching effectiveness with additional evaluation items included as the part-timer assumes other duties or makes other contributions to the institution. Seldin (1984) describes teaching "as encompassing three broad dimensions: content expertise, instructional delivery skills, and instructional design skills" (p. 82). These three dimensions provide a solid foundation upon which to develop an evaluation system for teaching effectiveness.

CONTENT EXPERTISE

Content expertise as described by Seldin (1984) involves skills, competencies, and mastery in a particular area. Clearly, students are not in a position to evaluate mastery of content. Peer or mentor evaluation would be the appropriate evaluation technique needed to gather information on content expertise. Techniques used could include classroom visitation, review of videotaped class sessions, or even the inclusion of part-timers in formal discussions of curriculum and course content.

INSTRUCTIONAL DESIGN SKILLS

Seldin (1984) divides instructional design skills into two parts. The first part consists of designing and sequencing instructional experiences to induce learning, and the second consists of measuring that learning has occurred. Components in instructional design include course syllabi, instructional materials, course or lesson objectives, and evaluation or testing methods. Clearly, this component is best evaluated by a peer, mentor, or department chair.

An instructional design component is not always appropriate when evaluating part-timers. In some institutions, the syllabi, handouts and tests are supplied by full-time faculty. In other institutions, part-timers are expected to design and prepare instructional materials with little or no support services provided by the institution. If inadequate support services are provided, the instructional design materials may be evaluated for content only and not on form, style, or medium of presentation.

DELIVERY SKILLS

Instructional delivery skills are defined by Seldin (1984) "as those human interactive skills and characteristics that promote or facilitate learning by creating an appropriate learning environment" (p. 83). Students are in a unique position to accurately evaluate a faculty member's delivery skills. Student evaluations are a key component in the evaluation system, but they cannot be the only component. Chair evaluation, which includes classroom visitations, will also provide firsthand knowledge of instructional delivery skills and classroom management techniques.

OUTSIDE THE CLASSROOM

An institution may want to consider evaluating part-time faculty on non-classroom factors. Some areas to consider are presented here in the form of questions. This is not intended to be a comprehensive list but merely a means to help stimulate thought toward other areas that might be pertinent for part-time faculty.

Does a part-timer bring prestige to the institution? Does the part-timer afford the institution the ultimate contact in a college-industry connection? How long has the part-timer been with the institution? Does the part-timer participate in college or departmental committees? Does the part-timer act as an advisor to students? How many students does the part-timer teach per course or per term? What level of courses, introductory or advanced, are taught by the part-timer? What are the times and locations of a part-timer's class? Is the part-timer willing to help the institution in times of high demand?

With all that must be considered in the development of evaluation systems, Miller (1986) offers the following insight: "We need to keep in perspective what evaluation is all about. It really is to serve students through providing better teaching and learning in a unique societal institution known as a college or university" (p. 167). Curiously enough, this perspective also describes the existence of two-year colleges.

REFERENCES

Miller, R. I. (1986). A ten year perspective on faculty evaluation. *International Journal of Institutional Management in Higher Education, 10*(2), 162-167.

Seldin, P. (1984). *Changing practices in faculty evaluation*. San Francisco, CA: Jossey-Bass.

INNOVATIVE SOLUTION TO AN EDUCATIONAL CHALLENGE (A CONSORTIUM APPROACH FOR FACULTY DEVELOPMENT)

Midge Carleton
Fernon P. Feenstra
Candis M. Martin
Lawrence E. Ordowski
Schoolcraft College

Schoolcraft College is committed to pursuing excellence in education. The college supports the philosophy that "teaching is an art." One way we pursue excellence is in our current faculty development program. The major emphasis of our program is to help faculty identify teaching strategies that enhance the delivery of knowledge, encourage student participation in the learning process, and bring students to higher levels of thinking through application and internalization rather than rote memorization of the material presented.

The Michigan Colleges' Consortium for Faculty Development (MCCFD) was established by identifying common and recurring problems related to developing full- and part-time faculty into skilled, caring, effective instructors and by realizing that a collaborative effort with other community colleges experiencing similar problems would be efficacious. This consortium now consists of members from five community colleges and a major university.

A consortia approach for faculty development has several advantages. MCCFD provides a broader based economic pool from which to draw and additional human resources and technical expertise for use in researching and solving problems. Materials can be field tested in a variety of educational environments, and the possibilities for networking new ideas and developing stronger ties between participating colleges are limitless.

One of the initial problems identified by the consortium was that of providing training in educational methodology for those employees who were highly credentialed but who have not been exposed to the "art of teaching." A solution to the problem is the presentation of eight well-researched, field-tested videotapes with accompanying modules in college faculty development programs. This series of tapes is a cost-effective approach which can be used to conduct workshops about timely topics facing the educational delivery system. Since this series of eight tapes emphasizes exposure to specific blocks of information, they need not be presented in any particular sequence. The target audience includes instructors who are new to college teaching and/or experienced college instructors who are interested in reviewing, refreshing, updating, or rethinking their teaching styles. The videotapes are based on actual classroom situations and are used to illustrate practical, effective, and innovative teaching methodologies.

Regardless of the developmental issue being addressed, a packet of materials is distributed to ensure the success of developmental programs. The packet includes (1) a letter of invitation to attend the workshop, (2) an agenda identifying the items to be covered, (3) a registration form to allow the faculty member to be granted continuing education credits for attendance, (4) a course syllabus to assist faculty with the opening session, (5) information on the Learning Assistance Center, (6) an evaluation form for the workshop, (7) an instructional evaluation form which is administered to the student during the courses of the semester, (8) a copy of the *Schoolcraft College Faculty Handbook* for 1990-1992, and (9) a monograph for the videotape being shown.

Discussion is facilitated after the faculty members have viewed the videotape. One particular unit, "Planing Instruction for Higher Levels of Thought," emphasizes the two principal teaching strategies, lecture and discussion. The videotape opens with an orchestra theme to focus on the idea that just as a conductor of an orchestra leads his or her members through the intricacies and nuances of a musical score, an instructor leads members of a class through the content and material of a subject. This module concentrates on the discussion method with emphasis on techniques to help orchestrate a discussion so that it might result in higher levels of thinking by students. Some concepts addressed by actual classroom scenes and discussed in the interviews are (1) styles of teaching and learning, (2) common experiences as the foundation for class discussion, (3) levels of thinking from the concrete to the abstract, and (4) questioning techniques.

In order to make effective use of this videotape, a module has been developed that identifies Bloom's six levels of thought: knowledge, comprehension, application, analysis, synthesis, and evaluation. The facilitator illustrates each level of thought. Knowledge, for example, is the lowest and most basic of the cognitive activities. Generally, college instructors who confine their presentations to lectures address this level of student thought. An example of learning at this level is recalling a set of specific commands learned to format a worksheet.

The highest level of thought in the taxonomy involves evaluation, a strictly intellectual operation that is rooted in a cluster of previous understanding, applications, analyses, and syntheses. Evaluations are always made in the light of criteria or standards, which can be thought of as being internal or external. Questions of accuracy, reliability, reasonableness, and exactness are illustrative of internally applied standards. Reference to contrasts, comparisons, and alternatives is usually the mark of external standards. Examples of learning at the evaluative level include assessing the soundness of one's own electronic spreadsheet by testing it with raw data and unknown conclusions and pointing out the strengths and weaknesses of conditioning theory when it is contrasted with Gestalt learning theory. Once the six levels of thought have been clearly identified, the facilitator involves the audience by asking them to identify specific objectives from their subject area which will lead the students through each level.

A similar approach is taken with the discussion phase of teaching. If the discussion approach is instructor centered, it is generally considered a recitation. Because the recitation approach is focused on materials already learned, it is not likely to generate higher levels of thought. Research discloses that as discussions begin to increasingly involve the students, a greater degree of higher-order thinking begins. Many instructors do not feel comfortable giving up control of classroom activity to their students. The transition from an instructor-dominated class to an even balance between the instructor and the student might begin by injecting more discussion into the course. Several ways of accomplishing this goal exist.

To begin this process, the facilitator could ask the following questions: Where do your classes appear on the discussion continuum? Based on your course objectives and the level of thought needed to accomplish those objectives, do you think your involvement in student discussions is appropriate? If not, why? What are the indicators that more discussion leading to higher levels of thought may be needed?

Although there are many ways to get a class discussion started, two stand out from the others. An easy way of initiating discussion is by using common experience. Such experience may include demonstrations, recordings, problems, field trips, films and videotapes, laboratory experiments, case studies, and readings. The experience should be concrete enough that all students can relate and understand, and it should also be related to the topic under study. A second way to stimulate class discussion is to raise a controversy. To be successful here, it is first necessary to make sure that the class members hold fairly strong convictions about the topic under study. A simple question can be asked to start the discussion.

Just as there are six levels of thinking, so too are there six broad categories of academic questions: (1) knowledge questions (e.g., asking for the computer commands needed to replicate the contents of a spreadsheet cell), (2) diagnostic and clarification questions (e.g., asking for the role commands serve in setting up an electronic spreadsheet), (3) hypothetical and action questions (e.g., asking for the use a college instructor might have for an electronic spreadsheet), (4) analytic questions (e.g., asking for the relationship between commands and functions), (5) summarizing questions (e.g., asking for a description of electronic spreadsheets), and (6) normative questions (e.g., asking for arguments about the superiority of electronic spreadsheets over "hand copy" spreadsheets). The facilitator should ask members of the audience to give at least one example of a question related to their subject areas that they can use for each level of thought.

There is an art to classroom questioning. Good discussion leaders listen carefully. They listen to catch the emotional tone of a student's response and try to identify the relevance of the response. They listen for what is left unsaid and for something in the response to help make a point to continue the discussion. In leading a discussion, the instructor should not be afraid of silence. It is often the best means of motivating students to answer questions. Once the discussion gets going, it will become unnecessary to rely on this tactic to generate responses.

An instructor can do many things to encourage students to respond: (1) create a classroom environment that is nonthreatening, (2) praise students for their responses, (3) avoid telling a student that an answer is wrong, and (4) avoid other replies that send a negative message to the students and therefore curtail further discussion. The instructor must plan the discussions in advance and take the time to summarize the major points of the discussion at its conclusion.

Instructors are fortunate that the faculty contract is supportive of faculty development efforts. At Schoolcraft College, new faculty members are provided with orientation materials according to their need for the first four semesters or sessions of employment. It has proven to be an excellent way of teaching "the art of teaching."

THE C-A-R MODEL: LINKING ADMINISTRATIVE PERFORMANCE AND PROFESSIONAL DEVELOPMENT WITH INSTITUTIONAL PLANNING

James A. Drake
Greenville Higher Education Center

If the supervision of employees is one of the major challenges of any organization, the challenges of staff supervision in public higher education are numerous and complex. The main source of this complexity is the governance model used by most colleges and universities. No matter what the label—"collegial governance," "shared governance," or some other variant—the governance system in public colleges and universities places a great deal of emphasis upon equal opportunity in employee recruitment and advancement, consistency and fairness in the evaluation of employee performance, and due process in the resolution of conflicts about employee evaluation.

On a daily basis, of course, most administrative supervisors in colleges and universities do not have to deal with the weighty consequences of equal employment and due process policies and procedures. Instead, they deal with the day to day challenges of ensuring that staff members are performing their jobs satisfactorily.

Administrators approach this challenge in a variety of ways. Some monitor staff performance informally, without resorting at all to structured evaluation models and systems. These administrators have a well-developed sense of effective staff performance, and they seem to sense intuitively when the staff performance is not effective. Some administrators, often those who are less experienced, rely on their institutions' performance-evaluation system to help them detect inadequacies in staff performance. To be sure, institutional performance evaluation models offer the advantage of a formal set of evaluation procedures that are well promulgated and usually well documented. But they also have a built-in disadvantage in that they can only be utilized according to the institution's own schedule, which does not allow a supervisor to intervene in problem situations before they become difficult to manage.

Seasoned administrators tend to monitor their staff members' performance more frequently than the schedule of an institution-wide evaluation system makes possible.

Whatever the frequency of administrators' assessments of staff performance—monthly, quarterly, semiannually—their intention is to detect and then intervene when a staff member's level of performance may be lacking in some important respect. The model described in these pages, the C-A-R Model, affords an easy way to do both.

OVERVIEW OF THE C-A-R MODEL

The C-A-R Model offers an administrative supervisor the dual advantages of detection and early intervention and represents a nonpunitive method for confronting and resolving inadequacies in job performance. The components of the model represented by the letters in the C-A-R acronym are challenges, actions, and results. Together, these three components represent a logical, pragmatic, bottom-line approach to monitoring and assessing the performance of staff members.

The way the model works is simple. At the beginning of a new planning or evaluation cycle, regardless of cycle length, an administrator needs to meet informally with his or her supervisees and to ask them individually to answer three basic questions about their job responsibilities, as the employee envisions them, for that particular cycle or time span. The questions are cast in simple, straightforward language:

1. What specific challenges will you be facing in your job during this cycle?

2. What actions do you need to take in order to meet those challenges?

3. What will be the results of your actions?

Given a nominal amount of time to consider these questions, any staff member who has been employed for any length of time should be able to answer them quite easily, especially if the exercise of compiling answers is kept simple and informal.

An easy way to keep the exercise simple is to ask each supervisee to jot down answers to all three questions on one piece of paper—challenges first, actions next, and the expected results last. To avoid lengthy answers, each supervisee should be told to feel free to answer in short phrases rather than polished sentences and reminded that the questions are meant as an exercise in analytic thinking rather than report writing.

Once a staff member's one-page answers are in hand, a conference should be scheduled for the supervisor and supervisee to review the sequence of challenges, actions, and results together. During the conference, the supervisor will want to place a premium on listening rather than talking. The purpose of the conference session is to give the supervisee—in a creative, collegial, and inviting way—an extended opportunity to elaborate on the challenges, actions, and results he/she has listed without being made to feel defensive about each answer. The supervisor, however, will want to keep in mind some related questions that may need to be asked. Each of these subquestions may help the supervisor detect problems with a staff member's ability to conceptualize and prioritize realistic goals and objectives.

THE "CHALLENGE" PHASE OF THE MODEL

The supervisor may find it necessary to ask a variety of subquestions related to each main question. For example, when asking the question "What specific challenges will you be facing in your job?" related subquestions might include

1. Are these challenges too conservative? Do they allow the staff member to play safe?

2. Are these challenges too large, too expansive?

3. What order or priority will the staff member assign each of these challenges?

Conservative Versus Expansive Challenges

As any experienced supervisor knows, one of the pitfalls of any self-evaluation exercise is the tendency for a person to set goals that are too easy to reach. A supervisor must be able to detect a staff member's tendency to want to play it safe by listing challenges that will require no great amount of effort to tackle. This tendency can be a fact of one's personality; some people tend to think small, though they are not conscious of this until they are made aware of it.

Others, however, tend toward the opposite extreme and try to undertake challenges that are simply too large or complex to be managed. One of the immediate benefits of the C-A-R Model is that a staff member's list of the challenges reveals whether they are attainable. If not, the supervisor is given an immediate opportunity to expand or contract the staff member's conception.

Implicit in any listing of challenges is priority. Knowing which challenges command attention first is a necessity on the part of every staff member. But here, too, some staff members may exhibit a tendency to play it safe by according the highest priority to the easiest challenges. Others may give top priority to the challenges that involve the kinds of work they enjoy most. In either situation, using the C-A-R Model enables an administrative supervisor to assess not only how but *how well* a staff member prioritizes the challenges of his/her job. It affords a constructive rather than punitive way of adjusting a staff member's priorities, if he/she happens to be at variance with the overall plans for the particular office, department, or division.

THE "ACTION" PHASE OF THE MODEL

The C-A-R Model calls for a staff member to list a set of challenges for a particular time period and to match with each one an action to meet the challenge. Here too, a staff member may inadvertently compile a list of actions that are lacking in logical consistency or in attainability during the time span of the evaluation cycle. Appropriate subquestions for a supervisor to ask when reviewing the specific actions with supervisees include

1. Is each action logically connected to the challenge it is meant to address?
2. Are all of these actions within this person's authority and responsibilities, or are they part of someone else's job?
3. Which of these actions is people related?
4. Which of these actions is structure related?
5. Is the staff member clearly separating people-related actions from structure-related ones?

An action is any activity undertaken by the staff member to meet the challenge he or she has cited, including drafting a policy, writing a funding proposal, revising a flowchart, or amending a budget.

One of the many advantages of the C-A-R Model is that it enables a supervisor to judge whether a staff member has conceived job-related challenges and actions in a logically connected way. Most often, staff members have a clear sense of what they need to do in order to meet a challenge. At times, however, they may list a particular action that has little connection to the challenge it is supposed to meet, resulting in an apples-and-oranges list of challenges and actions. When this discrepancy occurs, it must be rectified, and the collegiality of a private conference with the supervisee makes it possible to do so in a nonthreatening, nonpunitive way.

Supervisory responsibilities in higher education administration may be divided, in the broadest of terms, into two overlapping categories. The first category, structure-related responsibilities, includes those administrative decisions, initiatives, and tasks that relate to the flow of work in an administrative unit. The second, people-related responsibilities, includes the broad range of responsibilities that concern the productivity of the employees. To help clarify this distinction, suppose an administrator is assigned the responsibility for recommending whether the institution's academic affairs area would be better served by having academic divisions instead of academic departments.

To arrive at a recommendation, the administrator's task would be to conduct a comparative analysis of the benefits and liabilities of both kinds of units within the context of the current and projected student enrollment, the number of academic disciplines required by the curriculum, the number of full-time and part-time faculty employed within each discipline, and the student-to-faculty ratio the institution intends to maintain. In summary, the administrator would be concentrating on the productivity of one type of organizational structure (academic departments) as compared to another structural type (academic divisions). If, on the other hand, the administrator is assigned the responsibility of evaluating the performance of support staff in the academic affairs area of the institution, he or she would be concentrating on the productivity of people rather than the productivity of the particular structure.

The need to separate structural and people challenges is evident from the negative consequences of intermixing them. Suppose that one of the areas of administrative responsibility assigned to an administrator is admissions and that one of the staff members in that area has the responsibility for organizing recruitment trips. Suppose, further, that the staff member has cited as a high-priority the need to increase the number of potential student contacts by twenty percent over the next six months. If the administrator concurs, the question that needs to be asked next is whether this challenge is a people challenge or a structural challenge. Put a bit differently, he or she needs to ask what it will take in order to meet this challenge—a change involving people (e.g., the number or the performance of staff) or a change involving something structural (e.g., a policy, procedure, budget, or reporting line). If the action to meet the challenge of a twenty percent increase in potential student contacts is a people-related action, more recruiters may be needed or existing recruiters may have to be motivated to do more. If, on the other hand, the required action is structure related, it may involve the simpler task of rerouting the recruiters in order to make more efficient use of their time on the road.

What happens if the staff member in question is intermixing the two, consciously or unconsciously? Suppose that the enduring problem the staff member is facing is that one or more of the recruiters is simply not performing. If so, then the problem facing the staff member is a people problem; unless this problem is confronted and dealt with, no amount of structural adjustment will solve the problem.

The annals of organizational administration are replete with situations in which supervisors have tried to solve people problems with structural solutions. There is no mystery as to the reason why. Confronting people problems requires sensitivity, tact, and above all a willingness to confront a person when his or her performance is substandard. Not all supervisors have the ability or disposition that confrontation requires.

Lacking these, it is far easier to try to adjust a structure around the marginal or substandard performance of a staff member by hiring more staff in an attempt to surround and hide the performance problem. Such remedies are, at best, only a temporary salve for an enduring malady, and it is incumbent that any supervisor be certain that a structural action is not being taken where people problems stand in the way of meeting a challenge. Once again, the C-A-R Model affords a way to detect this.

THE RESULTS PHASE OF THE MODEL

In any organization, progress must be measurable. In the C-A-R Model, the term "results" is used to denote the bottom-line measure of progress. Subquestions an administrative supervisor needs to keep in mind when reviewing a staff member's listing of results include

1. Is each result logically connected to the action it is designed to follow?

2. Are all of these expected results quantifiable?

Just as actions must be logically connected to the challenges they are meant to address, so results must follow logically from the actions chosen. Here, too, it is important to remember that logical consistency cannot be legislated and that some staff members see such connections more readily than others. The C-A-R Model makes it possible to detect and rectify instances of inadequate or mistaken logic in a constructive rather than punitive manner because it makes possible a collegial opportunity for an administrative supervisor to review the sequence of challenges, actions, and results of each staff member.

QUANTITATIVE VERSUS QUALITATIVE RESULTS

In pragmatic terms, the best results, arguably, are quantifiable results. Asking supervisees to quantify the results they expect to see from their actions is done in business and industry in every phase of organizational planning. A ready objection might be, however, that requiring anticipated results to be quantified shifts the focus almost entirely from qualitative results. On closer examination, however, quanitifying does not present a major obstacle.

With few exceptions, qualitative improvements can be measured quantitatively. Staying with the recruitment example, the supervisee may have expressed a high-priority challenge as attracting more students of a higher academic quality. A close examination of the meaning of this challenge reveals that the phrase "higher academic quality" can be transformed into quantitative terms in a variety of standardized ways—including SAT scores, ACT scores, and grade-point averages, which can be expressed numerically.

SUMMARY

Many of the performance evaluation models used by colleges and universities are one dimensional and designed to grade employee performance at the close of a time period on the basis of the employee's assigned responsibilities as they appear in a standardized job description. Performance evaluation models of a more advanced design require not only the end-of-year standardized evaluation but also a planning phase at the outset of the evaluation period. During this planning phase, supervisors and supervisees are required to negotiate goals and objectives and come to some agreement on how these goals and objectives will be assessed. The C-A-R Model might be called a pre-evaluative tool since its purpose is to afford a simple and direct way for supervisors and supervisees to agree upon goals. Unlike most others, the C-A-R Model gives an administrative supervisor important insights into a supervisee's conception of job responsibilities, priorities, decision-making, and outcomes. The utility of the model lies in its simplicity and consistent focus on the logic of organizational management challenges, actions, and results.

STRATEGIES AND RESOURCES FOR PART-TIME FACULTY PROGRAMMING

Dee A. Fentiman
Austin Community College

INTRODUCTION

Part-time faculty are becoming an increasingly valuable asset to community colleges as we approach the year 2000. They are often relied upon to address the challenge of increasing enrollments and decreasing financial resources. But how do we insure instructional excellence with this diverse group of talented individuals? Professional development activities certainly offer a variety of opportunities, but programming for this group requires special consideration.

PURPOSE

The purpose of the presentation was to use techniques of experiential learning and group facilitation to identify (1) issues particular to part-time faculty programming, (2) resources and strategies for development of part-time faculty activities, and (3) examples of successful programs for part-time faculty.

OVERVIEW

During a preconference session of the Seventeenth Annual National Council for Occupational Education Conference in San Antonio, Texas, the above methods were used to determine strategies and resources for part-time faculty programming. Initially, the group identified issues related to the problem by simply listing the special needs of part-time faculty and acknowledging some of the problems with traditional methods of program delivery. It quickly became apparent that many were common problems. Strategies for addressing these issues and possible resources for program development were then identified, expanding upon a "starter list" presented by the facilitator.

Once the group participants were actively involved, the facilitator issued an invitation for participants to share successful programs used with part-time faculty. In the discussion that followed, specific programs were related to previously discussed issues and strategies. Alternate methods of delivery and additional resources were shared. The facilitator listed the programs and encouraged individuals to network with others. This material is presented in Tables 1 through 3.

The session was concluded with a group game called "Knots," which experientially demonstrated elements of cooperative problem solving and provided a fun closing for our time together.

Table 1
Part-Time Faculty Programming Issues

Diverse needs
Diverse interests
Diverse backgrounds
Diverse motivation
Diverse locations
Diverse schedules
Diverse teaching preferences
Isolation
Limited contact with other faculty
Limited contact with supervisors
Limited time for professional development
Limited affiliation with college
Lack of training
Lack of recognition
Other priorities (full-time employment, family, other part-time jobs)
Limited knowledge of college resources
Preconceived notions of teaching

Table 2

Strategies for Resolving Programming Issues

- Offer diverse methods of programming, including individualized, group, interactive, visual, audio, and social programming
- Provide opportunities for recognition and leadership
- Encourage innovation/input in the teaching/learning process, curriculum development, and professional development
- Offer workshops, seminars, and group activities during evenings and weekends, as well as during normal working hours Monday through Friday
- Have fun together

Table 3

Resources for Programming and Materials

Organizations

- National Council for Staff, Program, and Organizational Development (NCSPOD)
- Staff, Program, and Organizational Development (SPOD)
- League of Innovation
- Community College Consortium
- American Association of Community and Junior Colleges (AACJC)
- National Institute for Staff and Organizational Development (NISOD)
- National Center for Research in Vocational Education (NCRVE)
- American Society for Training and Development (ASTD)
- Other college personnel networks

Newsletters

- *Innovation Abstracts*
- *Teaching Excellence*
- *The Teaching Professor*
- *Adjunct Mentor*

Teleconference Technology

- Community College Satellite Network (CCSN)
- STARLINK (Vocational/Technical)

Educational TV

- Cable TV broadcasts
- Telecourses

Networking

- Colleagues
- Professional associations
- Part-time and full-time faculty

Table 3 (continued)

Programs/Support Services

- Mentor programs
- Mini-grant programs
- Brown bag lunches with part-time faculty as leaders
- Part-time faculty teaching awards
- Orientation sessions
- Professional development collections in learning resource centers
- Teleconferences: Live with local program development and taped and added to learning resource center collections
- "Why I Teach" features in college newsletter
- Ongoing workshops and activities which accommodate varied schedules
- Invitations to sit on ad hoc committees
- Brief instructional newsletters
- Ongoing invitations to college-wide activities
- Pot luck lunches/dinners
- Ice cream socials
- "Let's Talk Teaching" seminars

SUMMARY

The group concluded that part-time faculty are a highly diverse group with highly diverse needs. Therefore, diverse methods of delivery and constant efforts to acknowledge, include, and communicate with these valuable individuals are necessary. New technologies, such as teleconferencing and cable television, help span the distance and address the isolation adjunct faculty sometimes feel. Programs need not be expensive. Resources are plentiful. Barriers are broken down when colleagues network and when part-time faculty serve as workshop leaders. Successes must be shared within the institution.

THE PREPARATION AND NURTURING OF OCCUPATIONAL EDUCATION LEADERS

Curtis R. Finch
National Center for Research in Vocational Education
and
Virginia Polytechnic Institute and State University

INTRODUCTION

A number of factors point to the need to enhance capabilities of leaders in postsecondary occupational education institutions. Included among these factors are the institution's increasing obligation to forge partnerships with business, industry, and the community, its increasingly vital role in improving our Nation's productivity, and its growing obligation to meet the needs of diverse student populations. Addressing such challenges is indeed difficult, and without a cadre of persons available to provide meaningful institutional leadership, these challenges may never be fully addressed.

This presentation focuses on the role that postsecondary institutions can play in the preparation and continuing development of occupational education leaders. It is based on the premise that institutions can and should be key players in the development of their leaders. First presented are several thoughts about comprehensive leadership development, followed by suggestions for leadership development in technical and community colleges.

COMPREHENSIVE LEADERSHIP DEVELOPMENT

What leadership activities contribute to the preparation and continuing development of occupational education leaders? To obtain a better perspective, it may be useful to examine comprehensive leadership development and its components. In concept, the outcomes associated with comprehensive leadership development programs are not different from other programs. Basically, it is hoped that the individual is initially prepared for a relevant position and, once employed, will continue to grow and succeed. Discussion along this line will, therefore, center on (1) the role of teamwork in leadership development, (2) questions that planners should address as they embark on program initiation, and (3) a framework within which program planning and implementation may take place.

The Role of Teamwork

Before a ball game begins, it is important that the various players abide by a reasonable set of rules. Similarly, the various organizations, institutions, and agencies that plan leadership development must recognize their roles in relation to an individual's career. An individual's work with an organization might be a portion of a career that is linked to a graduate program or a part that reflects recent entry into a leadership position. Theoretically, a program can be greater than the sum of its parts. However, if each constituent group focuses on its own agenda at the exclusion of others' needs, the net result may be a nonprogram or a program that is disjointed or even ineffective. A reasonable suggestion is that universities, state departments of education, local education agencies, organizations, and technical and community colleges meet, discuss, and agree on their mutual expectations for aspiring and practicing leaders. They can then assume responsibility for meeting these expectations. Although it all sounds rather simple, collaboration of this type is most complex. Collaboration should not, however, be ignored since the potential benefits to individuals are very great.

The Role of Planning

Leadership program planning can consume much time. One way to streamline the process is by looking at planning's who, what, where, when and how. Simply stated, planners need to ask the following:

1. Who will take part in the program?
2. What leadership attributes will be gained and what will content contribute to meeting the expectations?
3. Where will the content be provided?
4. When will the content be provided?

5. How will the content be provided?

The first two questions, which serve as a basis for establishing content, need to be answered first. The other questions will most likely need to be answered concurrently since they are all linked to content delivery. For example, the expectation that an individual be proficient at networking might result in knowledge-related content being provided early in the program and application-related content being provided during an internship experience later in the program. The five questions serve as useful foci for the selection of meaningful program content and delivery.

A Leadership Development Framework

The five planning questions may be answered more efficiently if they are linked to a comprehensive view of leadership development. It may be useful to consider leadership development as being organized into four general phases: (1) foundation, (2) bridging, (3) practicum, and (4) practice.

During the foundation phase of leadership development, emphasis is placed on the development of knowledge (recall of leadership concepts and phenomena) and comprehension (a broad understanding of leadership). Resources and strategies typically associated with this phase are textbooks, handbooks, lectures, and discussions.

The bridging phase serves to narrow the gap between foundation studies and field experiences. This bridging may take place in the classroom, during a practicum, or as some combination thereof. Focus is on practice and application of effective leadership behaviors in safe settings such as simulations, case studies, and games. These may be accompanied by self-assessments that enable individuals to identify their strengths and shortcomings in a manner that will ultimately assist in designing their personal improvement programs.

During the practicum phase, leadership is further developed through structured and monitored experiences in actual educational settings. Resources and techniques typically associated with this phase are interning, externing, and shadowing. Finally, during the practice phase, individuals are provided opportunities to grow while being employed in a leadership role. Mentoring and induction programs for less experienced professionals, as well as many of the aforementioned techniques, may be used.

The role of resources may, thus, be seen as supportive and complementary to leadership development. Within a given leadership development arrangement, resources can be utilized to facilitate growth in ways that complement the specific contexts, objectives, participants, delivery, and assessments. Resources are selected for use in each phase of the development process with consideration to those resources' contribution to overall objectives, the unique characteristics of participants, and the context or contexts within which leadership development will take place. Resources must also relate to and support the content, its delivery and assessment. The overlapping nature of various phases should be noted. Just as leadership development content may flow from one phase to another, resources and strategies may be utilized in one or many phases to support that content.

SUGGESTIONS FOR LEADERSHIP DEVELOPMENT IN TECHNICAL AND COMMUNITY COLLEGES

Discussion to this point has focused on the more general aspects of leadership and leadership development. A question remains, however: How may technical and community colleges play an active role in leadership development? The answer to this question is in four parts, each of which suggests ways that an institution can assist in developing its own leaders. Four parts include (1) human resource development, (2) planning and teaming, (3) opportunities and incentives, and (4) resources and strategies.

Human Resource Development

At the center of an institution's leadership development activities is a comprehensive human resource development (HRD) unit. This is not the personnel department with a new wrapper. HRD reflects a commitment to the long-term development of each employee. In effect, if faculty members and others are expected to grow into leaders, they must have long-range development plans and individualized programs targeted toward personal growth, such as those currently available in business and industry. To provide human resources efficiently, an institution needs to (1) provide an organizational climate that is supportive of individual and professional growth, (2) empower individuals within the organization to organize and guide their own professional development, (3) prepare long-range plans for each employee's development, (4) map out leadership development programs for those persons who are interested in pursuing leadership positions and have the potential to become leaders, and (5) periodically assess each individual's progress toward short- and long-term professional goals.

Planning and Teaming

As indicated earlier, comprehensive leadership development involves looking at the who, what, where, when, and how of planning. Planners thus need to design leadership development programs that take providers, participants, content, and delivery into account. Of equal importance is teamwork. Why should a technical or community college take full responsibility for a leadership development program when others (e.g., universities, state departments of education, and organizations) may do much of the work more efficiently or at a lower cost? To develop teamwork in leadership training an institution should (1) set the parameters for the program, (2) build from a solid content base (e.g., leadership attributes), (3) decide who will be included in the program, (4) involve participants in the planning process, (5) determine what the institution's role will be in leadership development, and (6) use other sources to provide portions of the program.

Opportunities and Incentives

Participants in leadership development activities can be valuable resources to the institution. If participants do not recognize the program's value to them, however, they may choose to drop out or, worse yet, move to other institutions. It is, therefore, important that individuals recognize the value of completing a leadership development program and remaining at the institution. Opportunities and incentives that reflect potential future payoff to individuals include increased leadership responsibilities, higher pay, increased authority, and personal recognition and enhanced status. Institutions might, for example, (1) spell out the opportunities that may accrue for potential leaders, (2) make some promotions from within the organization, and (3) reward those who assume leadership positions.

Resources and Strategies

The success of leadership development efforts can often depend on the selection of quality resources and strategies. Examples of resources and strategies include case studies, simulations, internships, and assessments. Leadership program planners are responsible for selecting resources and strategies that provide the greatest benefit to participants. For example, the Leadership Attribute Inventory (LAI) instrument developed by the National Center for Research in Vocational Education might be useful for participant self-assessment during and at the conclusion of a program. To ensure success in leadership development, institutions should (1) select resources and strategies that will have the greatest impact on program outcomes, (2) consider a variety of resources and strategies to make the program more lively and meet more participants' personal needs, and (3) employ resources and strategies in relation to the four phases of leadership development (foundation, bridging, practicum, practice).

CONCLUDING COMMENTS

This discussion has centered on the preparation of occupational education leaders. Community and technical colleges have a vital role in leadership development. For institutions that want to initiate leadership programs, several suggestions have been provided. It is hoped that these comments will stimulate community and technical colleges to become more proactive in leadership preparation.

BIBLIOGRAPHY

Bennis, W., & Nanus, B. (1985). *Leaders: The strategies for taking charge*. New York, NY: Harper & Row.

Finch, C. R., & Faulkner, S. L. (1990). The occupational education administrator's role in developing a competent workforce: Case studies of success. *Journal of Studies in Technical Careers, 12*(4), 341-351.

Finch, C. R., Gregson, J. A., & Faulkner, S. L. (1991). *Leadership behaviors of successful vocational education administrators*. Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Finch, C. R., Gregson, J. A., & Faulkner, S. L. (1990, December). *The role of communication in administrative leadership*. Paper presented at the American Vocational Association Annual Convention, Cincinnati, OH.

Finch, C. R., & McGough, R. L. (1991). *Administering and supervising occupational education*. Prospect Heights, IL: Waveland.

Hoerner, J. L., Clowes, D. A., Lichtman, M. V., & Allkins, M. T. (1991). *Professional development programs, leadership, and institutional culture: Lessons from a study of professional development programs for community college occupational-technical faculty*. Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Moss, J., Finch, C. R., & Johansen, B. C. (1991). When is a vocational administrator effective as a leader? *Journal of Industrial Teacher Education, 29*(1), 7-21.

Moss, J., & Johansen, B. C. (1991). *Conceptualizing leadership and assessing leader attributes*. Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Moss, J., & Liang, T. (1990). *Leadership, leadership development, and the National Center for Research in Vocational Education.* Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Roueche, J. E., Baker, G. A., & Rose, R. R. (1989). *Shared vision: Transformational leadership in American community colleges.* Washington, DC: Community College Press.

AN INTRODUCTION TO TEACHING CONSULTATION

Michael Kerwin
Judith Rhoads
University of Kentucky Community College System

One of the most popular faculty development programs offered in the University of Kentucky Community College System (UKCCS) is the Teaching Consultation Program. Since Teaching Consultation was implemented in 1977, over five hundred UKCCS faculty have participated in the program, and participants have consistently given it excellent ratings.

This paper introduces faculty and administrators to the Teaching Consultation Program by addressing four major questions:

1. What is the Teaching Consultation program?
2. How does it work?
3. What does it do?
4. How can a college start a consultation program?

This paper also identifies the key elements of effective consultation and describes a case study using the Teaching Consultation program.

INTRODUCTION

Basically, Teaching Consultation is a peer consulting program available to faculty who wish to analyze their teaching behaviors and make changes in their teaching. Teaching Consultation is confidential, structured, voluntary, and independent of performance review. Faculty members recognized by their colleagues as outstanding teachers attend a preparatory workshop prior to serving as consultants. Teaching consultants are released from a three-hour class each semester to work with two or three faculty members. In the

1991 spring semester, twenty teaching consultants worked with twenty-nine faculty clients on eleven of the fourteen UKCCS campuses.

KEY ELEMENTS

Teaching Consultation is different from other collaborative faculty development programs (e.g., mentoring) in at least six ways. First, the consultants are carefully selected and prepared to conduct the program. Second, participation in the program is voluntary. Third, the program is owned by the faculty. Fourth, consultants follow a well-defined set of procedures when they consult with a faculty client. Fifth, the materials used in the program are field tested and research based. Sixth, research has shown that participation in the program has resulted in changes in teaching. Every aspect of the Teaching Consultation Program reflects these elements.

PROCEDURES

When consultants conduct the program, they follow a set of procedures developed in the School of Education at the University of Massachusetts at Amherst in the early 1970s. These procedures, which Bergquist and Phillips (1977) describe in *A Handbook for Faculty Development*, are designed to help faculty recognize and consciously develop instructional behaviors appropriate for themselves and their students. The key stages are outlined below.

The Initial Interview

The consultant meets with the faculty member, clarifies the confidential nature of their relationship, explains the process, and identifies a specific class to observe. The faculty member is asked to agree to participate in the process for the entire semester. If the faculty member agrees, the consultant arranges to begin data collection.

Data Collection

To obtain information about the instructor's teaching behaviors, the consultant interviews the faculty member, observes him or her teaching the selected class, videotapes an instructional session, and administers a questionnaire to the students. This stage requires about four weeks.

Data Review and Analysis

The consultant and the faculty member review the collected data. Together, they identify at least three teaching strengths and at least three areas for improvement.

Planning and Implementing Changes

The consultant and the faculty member identify three or four teaching improvement goals. The consultant helps the faculty member design and implement strategies to meet these goals. This stage requires at least eight weeks, and the instructor's progress is monitored weekly.

Evaluation

In the final three weeks of the semester, the consultant evaluates the instructor's success in achieving his or her goals by videotaping and administering a questionnaire to another class. The data is jointly reviewed and the instructor evaluates his or her experience in the program.

One of the key components of the Teaching Consultation Program is the Teaching Analysis by Students (TABS) questionnaire, based upon the research of Wilson, Dienst, Wood, and Bavry (1975) at the University of California at Berkeley and the University of Massachusetts at Amherst. The original questionnaire contains thirty-eight items describing instructional behaviors and twelve items describing student characteristics. The version used in the Teaching Consultation Program contains fifty items but has been modified somewhat to meet the needs of community college students and faculty.

Results from a three-semester study conducted in UKCCS indicated that faculty who participated in the Teaching Consultation Program raised their TABS ratings significantly as compared to a control group who did not take part in the program. Furthermore, this higher rating persisted in the experimental group the semester following their participation in the program. Faculty who have participated in the program praise it. A typical comment on a participant evaluation form is that the Teaching Consultation program is "a wonderful opportunity to meet regularly with colleagues and talk about teaching."

A Case Study

The following hypothetical case study illustrates how the Teaching Consultation Program works and how it can improve a faculty member's teaching. The case is a typical success story in the Teaching Consultation Program. Although not all outcomes are as dramatic, many are.

Teacher A has taught an introductory business management course for two years. Before coming to Anywhere Community College, Teacher A was a sales representative for a large retail organization for three years. This teacher also holds a master's degree in business administration. Although Teacher A has received relatively high ratings on the student evaluations, Teacher A is becoming frustrated. The students in the business management course appear bored and come to class unprepared. Teacher A is considering leaving teaching and returning to business. Talking to a friend in the business division, Teacher A hears about the Teaching Consultation Program and decides to talk to the consultant.

Teacher A and the consultant begin their work together with an initial interview. The consultant describes the Teaching Consultation Program, and Teacher A agrees to participate. In a second interview, Teacher A talks about teaching methodology in depth, and the consultant learns about the concerns for students who appear bored and apathetic. Teacher A invites the consultant to observe the class. The consultant videotapes an instructional session and administers the TABS questionnaire to the students.

After the questionnaire responses have been processed, Teacher A and the consultant review the questionnaire and videotape. They identify three teaching strengths and three areas for improvement. They decide to implement strategies to involve the students in the learning process and to make the teaching process more dynamic. One such change involves lecturing in front of the podium.

The consultant continues to meet weekly with Teacher A. Three weeks before the semester ends, the consultant videotapes the class again and asks the students to complete another questionnaire containing items drawn from the TABS. The results of the videotape and the questionnaire indicate that the students are indeed more actively involved in the class. An equally important change has occurred in Teacher A. Teaching has become more enjoyable, and Teacher A appears more self-confident and relaxed. In fact, Teacher A has decided to remain in teaching for another year. Teacher A likes seeing the students get excited about business.

Program Implementation

Implementation of a teaching consultation program requires (1) administrative commitment to a faculty-controlled program that is independent of performance review; (2) coordination of the consultation calendar, computer logistics, and workshops; (3) preparation to process the TABS questionnaire; and (4) selection and preparation of the teaching consultants. Although consultants follow a defined set of procedures in the Teaching Consultation Program and use a research-based student questionnaire, the crucial element is the consultants' ability to assist their colleagues in recognizing and consciously developing instructional behaviors most appropriate for themselves and their students.

The selection and professional development of teaching consultants is of utmost importance. As indicated earlier, only faculty who are recognized by their colleagues as outstanding teachers are invited to become teaching consultants. If they accept the invitation, these faculty members must participate in an intensive two-day workshop. It is interesting to note that almost all of the UKCCS consultants have been clients in the Teaching Consultant Program.

Consultants who are working with faculty clients at UKCCS are also required to attend a two-day workshop each semester that they are consulting. At the workshop, they present a twenty-minute introduction of each of their clients, including a ten-minute videotape and summary of the results of the TABS questionnaire. In a brainstorming session following the presentation, other consultants suggest teaching improvement strategies that the presenter could use with his or her clients.

The system-wide coordinator for the program also arranges for other professional development activities for the consultants, such activities include workshops, symposia, and national conferences or applying for research grants.

Program Administration

In UKCCS, the coordinator for Faculty/Staff and Program Development, a member of the Chancellor's staff, coordinates the Teaching Consultation Program. College presidents recruit teaching consultants and provide them with travel appropriations and release time. The compliments given the Teaching Consultation Program have convinced college presidents that the program is worthwhile.

REFERENCES

Bergquist, W. H., & Phillips, S. R. (1977). *A handbook for faculty development* (Vol. 2). Washington, DC: Council for the Development of Small Colleges.

Wilson, R. C., Dienst, E. R., Wood, L., & Bavry, J. L. (1975). *College professors and their impact on students*. New York, NY: John Wiley & Sons.

SECTION IV

STRATEGIES FOR TEACHING AT-RISK YOUTH AND ADULTS IN THE 1990s

FACULTY INSERVICE: ALTERNATIVE STRATEGIES FOR STUDENTS WITH DISABILITIES

Susan B. Asselin
Virginia Polytechnic Institute & State University

Jeananne Dixon
New River Community College

An increasing number of students with disabilities are entering postsecondary programs (Heath Resource Center, 1991). While these students have made it through the secondary system, they require some accommodations in instruction in order to be successful at the postsecondary level. Individuals with disabilities are guaranteed accommodations through Section 504 of the Rehabilitation Act of 1975. Community college faculty must become aware of the rights and needs of these students and develop commensurate skills to facilitate the learning process.

In 1991 a needs assessment was conducted for the Virginia Community College System (VCCS) to provide state and local administrators with direction in curriculum development, business and industry linkages, and special populations accommodations (Elson & Asche, 1991). The results of this assessment pointed to the need for a series of workshops for counselors, faculty, and administrators to increase their knowledge and skills in working with special populations.

To improve instruction of students with disabilities and develop skills of community college faculty, the Southwest Virginia Transition Center, Postsecondary Transition Program, provided a series of five inservice sessions across the state. Over 120 community college faculty in English and math, counselors, and administrators attended the sessions. The goal of the inservice program was to prepare a team to present the information to their colleagues and stimulate interest in serving students with disabilities. The team was provided with examples of specific inservice activities that could be implemented at the home college.

The inservice format was organized around three objectives. These included (1) developing sensitivity to the needs of students with disabilities, (2) providing an overview of pertinent legislation, and (3) demonstrating a team approach to implementing instructional accommodations. The following sections will delineate the content covered in the inservice.

STUDENTS WITH DISABILITIES

Due to legislative mandates such as PL 94-142, the Education for All Handicapped Children Act of 1975, increasing numbers of students with disabilities are being prepared to enter postsecondary education with continuing support services. The number of entering freshmen reporting a disability has more than doubled since 1978. The Heath Resource Center (1991) categorizes the disabilities of entering freshmen: 31.7% partially sighted or blind, 15.7% health related, 15.3% learning disabled, 13.8% orthopedic, 11.6% hearing, and 22.3% as others.

As students with disabilities move from secondary to postsecondary education, a significant change in status occurs. Students are entitled to an education until they are twenty-two years of age while in secondary programs. All the protections and assurances guaranteed under the Education for All Handicapped Children Act of 1975 are afforded to these individuals and their families. When the students graduate, they are instantly plunged into an adult system where they are no longer entitled to such services, but they become eligible based on new criteria and definitions.

Therefore, the student with disabilities has certain responsibilities as an adult to ensure eligibility for services. Unfortunately, young adults with disabilities are often reluctant to identify themselves (Allard, Dodd, & Peralez, 1987; Longo, 1988), and they have a right not to be identified if they so choose. They want to free themselves of the stigma of special education and feel that they are capable of success. Then, the rigors of higher education (e.g., intensity of courses, immense amount of material to be covered, lack of individualization in large classes) test a student's ability to succeed without support services. While most faculty are concerned with maximizing the learning experience for all students, the student with a disability must develop independence and self-advocacy. Students need to learn how to explain their disability, describe their needs, and negotiate appropriate accommodations. Students should also be aware of certain accommodations and nondiscrimination rights.

LEGISLATIVE MANDATES

Section 504 of the Rehabilitation Act of 1973 guarantees civil rights for students with disabilities. With respect to postsecondary services, standards are requisite to admission and to participation in a program or activity. No language or intent of Section 504 abridges the freedom of an institution of higher education to establish academic requirements and standards. Furthermore, certain accommodations must be provided such as notetakers, tutors, extended time on tests, and alternative testing procedures.

Another piece of legislation, the Carl D. Perkins Vocational Education and Applied Technology Act of 1990, has implications for postsecondary students. It, too, mandates provision of nondiscriminatory accommodations, thus reinforcing the Rehabilitation Act requirements. Funding for vocational programs is based upon the proportion of Pell Grant recipients compared to total number of recipients in the state. Eligible recipients may use these funds for program improvement with full participation of individuals from special populations. Certain assurances are afforded students with disabilities. These include equal access in recruitment, enrollment, and placement activities and equal access to a full range of programs.

A third piece of legislation, the Americans with Disabilities Act of 1989, extends civil rights protections for persons with disabilities to employment, transportation, public accommodations (e.g., theaters, stores, restaurants), services provided by state and local government, and telecommunications. Employers doing business with the federal government or receiving federal funds have been complying with these mandates for the past fifteen years. The social and economic benefits of these accommodations will be considerable. In addition to removing persons from expensive dependency programs, increased tax revenues from the productivity of working disabled persons will be realized.

MAKING ACCOMMODATIONS

Before an instructor is able to make accommodations, it is essential that a student identifies the existence of a disability. With the current emphasis on transition from school to work in secondary special education, a special education teacher or transition coordinator may provide information to postsecondary support service personnel. Once this is accomplished, the support services staff can get to know the student and determine the most appropriate accommodations. The place to start in determining appropriate strategies is to ask the student what has worked in the past. By the time a student is enrolled in postsecondary education, a series of strategies may have proven to be successful.

The next step in making accommodations is determining faculty attitudes. Before accommodations are made for students, faculty must examine their own fears and prejudices to ensure that their preconceptions do not result in behaviors that limit the potential of persons with disabilities. The following is advice to help faculty members overcome these feelings: (1) offer help but wait until it is accepted before giving it; (2) talk directly to the person with a disability, not to someone accompanying the person; (3) treat the person as a healthy person; (4) keep in mind that the individual has the same activities of daily living that you do; (5) accommodate the student in the classroom; and (6) help the student to assume equal responsibility for determining successful accommodations. Faculty must develop a sensitivity to students who are experiencing learning problems. Students experience difficulty in identifying themselves as different, especially if the disability is hidden, as in the case of a learning disability (Allard et al., 1987). Students are more likely to approach a faculty member who is receptive to discussion. Also, a classwide invitation to students who feel that they need accommodations can open the door to such disclosures. When an instructor discovers that a student's disability has not been identified, a referral for further testing with campus support services is recommended.

Allowable modifications for making postsecondary programs more accessible are outlined in the provisions of Section 504. Modifications such as a change in length of time allowed to complete a degree and adaptation in conduct of specific courses are permissible to ensure that academic requirements are not discriminatory. Students must be evaluated on their achievement, not on their impaired sensory, manual, or speaking skills. Finally, the provision of auxiliary aids, taped texts, interpreters, readers, adapted classroom equipment, and other support services may be provided to the student with disabilities.

What is appropriate for an individual student is determined by the student, the support service provider, and the faculty member. Once a student has identified the presence and nature of the disability for the faculty member, the student is the best source of information regarding the most effective accommodations. The student can provide information on accommodations that work best from past experiences. With the faculty member, the course requirements can be discussed and strategies negotiated.

INSERVICE EVALUATION

The information in the preceding sections concerning students with disabilities, pertinent legislation, and accommodations was covered in the faculty inservice. Specific activities related to inservice objectives were established by the participants. Included were examples of (1) a panel of students with various disabilities, (2) a case study of a student with a disability, (3) a discussion of legal mandates and faculty responsibilities, and (4) a review of course syllabi and team recommendations for accommodations.

Participants were asked to complete an inservice evaluation. The mean response for the fourteen-item Likert-type scale was 4.75 on a five-point scale with 5.00 as excellent. Participating faculty members, administrators, and support service personnel were contacted four months and ten months after attending the inservice project. The purpose of the follow-up was to determine whether the community college program had experienced any changes in number of student referrals, in contacts with student services, or in assistance to other faculty members. Twenty-five faculty, administrators, and support service personnel responded to the survey. Nine of the respondents indicated an increase in student referrals. Twelve respondents indicated weekly contact with student services regarding students with disabilities. With regard to assisting other faculty members, nineteen had informal discussions, sixteen had suggested possible accommodations, twelve provided information about students with disabilities, and ten shared the workshop booklet with others. The majority (80%) of participants also indicated the need for more regional workshops for faculty members. Major topics of interest included learning disabilities, learning strategies, available resources, and laws.

Finally, an informal survey was conducted ten months after the inservice projects. Support service personnel in all thirteen community colleges in Virginia reported that as a result of the inservice program, school-wide advisory councils were established to develop, implement, and monitor policies and procedures to provide services to students with disabilities. The VCCS will continue to strive to serve the growing population of students with disabilities. By providing faculty with the necessary skills and knowledge for producing quality programs and meeting needs of students with disabilities, more students will have a chance to succeed.

REFERENCES

Allard, W. G., Dodd, J. M., & Peralez, E. (1987). Keeping LD students in college. *Academic Therapy, 22*(4), 359-365.

Elson, D., & Asche, F. M. (1991). *Virginia Community College needs assessment.* Unpublished report, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Heath Resource Center. (1991). Facts you can use: Information from Heath. *National Clearinghouse on Postsecondary Education for Individuals with Disabilities, 10*(2), 1.

Longo, J. (1988). The learning disabled: Challenge to postsecondary institutions. *Journal of Developmental Education, 11*(3), 10-12.

THE TECHNOLOGY INTERVENTION AND SUPPORT PROGRAM

Shirley Barton
Kent State University, Regional Campuses

Elaine Shively
Kent State University, Trumbull Campus

The Kent State University Regional Campuses are a group of seven community-oriented institutions serving the educational needs of northeastern Ohio through the provision of associate degree programs, baccalaureate-parallel coursework, and developmental and continuing education. Approximately 8,300 students are enrolled at the regional campuses. Two-thirds are female, and the average age of students is twenty-seven. The Kent State campus provides baccalaureate, masters, and doctoral study opportunities on a large residential campus located near Cleveland and Akron.

The regional campuses have an open admissions policy that admits students on an unconditional or conditional basis, as determined by scores on a standardized test, the Basic Skills Assessment (BSA). If necessary, the students are referred to developmental courses. Approximately three of ten students need a developmental English course, and approximately three of four need a developmental mathematics course. Roughly half of the students tested need at least one reading course.

PROGRAM OBJECTIVES

Funded by a Carl Perkins' Vocational Education Special Needs Service Plan, the Technology Intervention and Support Program (TISP) was implemented for the spring semester of 1991 to serve at least fifty of the most academically disadvantaged technology students attending the Ashtabula and Trumbull regional campuses of Kent State University. The objective of the program was to supplement the existing developmental education program with a formal, more personally tailored and intrusive program.

IMPLEMENTATION

Two Technology Intervention Specialists, one each in English/reading and mathematics, were hired to prepare and implement an individually prescribed program (IPP) for each participant to correct his or her deficiencies in these basic skills. Technical students with the lowest BSA scores were invited by letter and given admissions priority. Students enrolled in the program were interviewed to obtain additional pertinent data before their IPP objectives were written. Students were provided one-hour appointments at least once a week with each specialist. Supplemental work and enrichment activities related to a student's coursework were integrated into each IPP.

A file including BSA scores, major, grade point average, course transcript, current courses, credit hours enrolled, and personal information was established for each student. The file also contained a tracking sheet for each IPP objective with sections to record the activities of each session a student had with a specialist relating to that objective. An objective summary sheet was also developed for each file.

PROFILE OF PARTICIPANTS

Skill Area/Gender/Minority

Of the fifty-three participants in the program, thirty-four percent received assistance in English only, forty percent received support in mathematics only, and twenty-six percent received help in both skill areas. Over two thirds (68%) of the participants were female, and only thirteen percent of them were minority students.

Skill Deficiency Levels

The placement guidelines for the BSA, established by a local norming process consistent with the national norms provided by the test publisher, were helpful in identifying other profile characteristics of the participants. While the participants' mean score in reading was only 0.2 from the placement cutoff score for the more basic developmental course in reading, it was 7.2 from the cutoff score required to waive the more advanced developmental reading course. The participants' mean English score was over seven points below the placement cutoff score needed to waive the developmental course in English. The mean arithmetic score of the participants was almost six points below the score required to waive the lower of the two developmental courses in mathematics. The mean algebra score was sixteen points below that needed to waive the more advanced developmental course. Although many students enrolled in developmental courses during the semester in which they received assistance, several were also enrolled in advanced courses like technical writing and intuitive calculus. The number of students enrolled in nondevelopmental courses also indicates that many were beyond the basic skills level yet still sought assistance in mathematics and/or English.

Majors

Although the participants represented a variety of twelve technical majors, twenty-four percent were pursuing an associate degree in nursing and nineteen percent were business management technology majors. Other majors well represented by the participants were accounting technology (11.0%), computer technology (7.5%), and electrical/electronic engineering technology (7.5%).

Age Group/Academic Classification/Hours Enrolled

The majority (79%) of the participants at both campuses were twenty-one years of age or older, and most (64%) of them were freshmen. Almost half (47%) of the participants were full-time students. The fifty participants enrolled for classes represented a total of 505 semester hours with a mean of 10.1 semester hours per student enrolled.

Composites

The data provided about the students suggest that the composite profile of the typical participant differed from one campus to the other. The typical participant at the Ashtabula Campus appears to have been a nontraditional, full-time, white, female freshman working to pursue an associate degree in nursing. On the other hand, the typical participant at the Trumbull Campus was a nontraditional, part-time, white, male or female freshman pursuing an associate degree in applied business with a major in business management or accounting technology. Thus, the composites for the two campuses differ in gender, hours of enrollment, and major. Race, age group, and academic rank of the participants at both campuses were similar.

OUTCOMES

Grade Point Average

Several ways of measuring value added were planned to assess the outcomes of the program. The average cumulative grade point average of the participants increased 0.34. The greatest increase (7%) was in the 2.01-3.00 interval, and the largest decrease (13%) was in the 0.00-1.00 interval. Subjection of this data to a t-test indicated that participants did not have significantly improved grade point averages after the intervention, either for both campuses in combination or separately.

Basic Skills Assessment Scores

A comparison of pre- and posttest scores on the BSA was planned to provide an additional value-added measure. However, lack of student cooperation in the retesting prevented the gathering of sufficient data for comparison purposes.

English and Mathematics Grades

The comparison of participants' grades in English and mathematics before and after receiving TISP intervention was also analyzed. However, only twelve of the participants receiving English assistance had previously taken an English course. A similar sample (13) receiving mathematics assistance had taken a previous mathematics course. Although the number of students receiving grades of A and D in both English and mathematics courses increased, the other grade categories record decreases. However, such a small sample hampers the formation of substantial conclusions about this value-added measure.

Hours of Assistance

Based on level of need, occasional conflicts, and student availability, some students received more hours of assistance than others. The largest percentage of students in both skill areas (59% English, 60% math) received from one to six hours of assistance. Yet, approximately one third (38% English, 31% math) of the participants received between seven and twelve hours of help in each skill area. Only four students (3% English, 9% math) were represented in the thirteen to eighteen hours range.

Other

In addition to the personalized, remedial, and enriched instruction, other outcomes that are not easily measured were apparent. Students were taught study skills and skill maintenance and were encouraged to complete their homework and assignments on time. The one-on-one attention on a regular basis over time provided positive reinforcement of learning. Students had to look realistically at their skills and needs, yet the assistance provided them seemed to improve their self-esteem and to help them advance in their studies. Students also learned how to study for tests and curb test anxiety.

EVALUATION

The TISP appears to be a successful model for the extension of developmental education at the Kent State University Regional Campuses. It is the first program in the regional campuses that exclusively provides students with the writing and implementing of IPPs designed to help them overcome their personal deficiencies in the content areas of mathematics and English. The program also translated into tuition dollars and improved student retention for the university. For example, after an invitation to participate in the program, a student who had not planned to return to school enrolled for technical writing. Numerous similar examples have been documented.

The two major strengths of the implementation process involved the selectivity approach that was used. Because the participants originally were told they had been "selected" for program inclusion, the potential of a negative program image was eliminated to a large degree. Many students who were not selected asked developmental coordinators how they, too, could receive this help. This approach was further supported by the fact that the program actively sought students to enroll, as opposed to the status quo paradigm that places the burden on the student to seek assistance.

At the end of the program, each participant was asked to complete a form to rate both the program and the specialists. The summary of the quantitative evaluation ratings and the qualitative comments of the participants indicated a strong positive response and support for continuing the program.

RECOMMENDATIONS

The participants and the administrators involved recommend that the TISP become a permanent part of the developmental education services provided at the Ashtabula and Trumbull campuses for students of all majors and that other campuses in the system also be given the opportunity to examine it as a plausible model for implementation.

The following recommendations were made for refinement of the program as it continues: (1) make faculty more aware of the program so that they may promote it within their classes and refer more students; (2) advertise the program in conjunction with the Skill Center; (3) encourage the Skill Center tutors to refer students to the program; (4) develop a stronger commitment from program participants to take a post-Basic Skills Assessment and complete an evaluation form; (5) have specialists available to meet with students more often, preferably within twenty-four hours of their classes and at least twice a week; (6) hire a specialist in each skill area for each campus since student demand justifies it; and (7) continue the established research design, expanding the sample size and value-added measures.

INTERINSTITUTIONAL EDUCATIONAL ALLIANCES AS AN AT-RISK STUDENT RECRUITMENT AND RETENTION STRATEGY

John L. Bradley
Maricopa County Community College District

INTRODUCTION

Interinstitutional educational alliances have appeared as educators have come to realize that modern societal problems are simply too overwhelming for any one institution to solve. All educators must work together if the educational establishment is to have a positive impact on the lives of citizens.

The problems facing citizens in the greater Phoenix area are similar to problems facing the citizens of many large American cities. Some of these problems include (1) the lack of high school diplomas, (2) illiteracy, (3) the lack of minority educational success, and (4) poverty. These problems are expanded upon in the next few paragraphs.

According to the latest information, we know that more than 1,600 Phoenix Union High School District seventeen-year-old students will not graduate this year as scheduled. These students have been enrolled in high school for more than three years, but they have completed fewer than five high school classes. An even larger number of young people have simply given up. More than three thousand young people drop out of the Phoenix Union high schools each year. The lack of a high school diploma makes it very difficult for a young person to compete for a job that pays well in today's workplace.

Currently, thirteen percent of all of the seventeen-year-olds enrolled in the Phoenix Union High School District are functionally illiterate, and forty-four percent are only marginally literate. Literacy is a fundamental requisite for full participation in modern American society.

Minority citizens are much less likely to complete high school or earn a college or university degree. At this time, fifty-five percent of Phoenix Union High School students belong to minority populations. Minority students account for as much as seventy-three percent of the total enrollment in some Phoenix urban elementary school districts. An increase in the number of minority citizens who succeed in school must occur if this nation is to be a place of opportunity for all citizens.

More than ten percent of everyone who resides in Maricopa County lives in poverty, and thirty-six percent of those living in poverty are under the age of eighteen. In some inner-city school districts, as many as forty percent of all students receive subsidized lunches, meaning their families meet the stringent federal poverty guidelines. Completion of a formal education is one way out of poverty.

These are only four examples of the many problems facing citizens who reside in the Greater Phoenix Area or any other large America urban community. The problems are overwhelming.

INTERINSTITUTIONAL EDUCATIONAL ALLIANCES

Community colleges are in a position to foster interinstitutional educational alliances because they are often the link between high school and employment or a baccalaureate degree. This linkage has been strong for more than twenty-five years. A recent change, however, is the establishment of formal interinstitutional educational alliances in an effort to coordinate high school, community college, and university curricula so that students can progress without duplication of time, energy, or expense.

Interinstitutional educational alliances have evolved as waves of innovation. The Maricopa County Community College District (MCCCD) is now riding the third such wave, and a fourth is beginning to swell as each wave builds on the last. Development of the community college-university alliance constituted the first interinstitutional alliance wave because the university transfer education mission has historical precedence. Community college to university transfer policies and procedures have been in effect for so many years that they are well institutionalized.

University equivalents to the almost six thousand courses in the Maricopa Community Colleges Course Bank have been negotiated and are published annually in the *Course Equivalency Guide*. Persons who have successfully completed an equivalent course at a community college may apply credits earned towards a baccalaureate degree when they transfer to one of the three Arizona public universities.

The second wave began in 1983 after the Arizona State Legislature mandated coordination of high school and community college employment preparation programs. Legislators had three goals: (1) improvement in the quality of high school instruction; (2) coordination of curriculum so that students could progress without duplication of time, energy, or expense; and (3) cost-effective use of expensive vocational education laboratories. This high school-community college employment preparation alliance took three forms: (1) course credit articulation for high school graduates who have mastered the competencies equivalent to a college course, (2) occupational credential acceptance for students who have previously earned a Nursing Assisting Certificate of Practical Nursing License, and (3) resource coordination of employment preparation programs in nearby high schools.

The latest high school-community college employment preparation alliance schema is being promoted by the government of the United States in the form of Tech Prep. The federal government is providing monetary grants to high schools and community colleges that agree to develop coordinated employment preparation programs that lead to a community college Associate in Applied Science degree in the fields of engineering, applied science, industrial technology, allied health, nursing, or a specific trade.

The third wave of interinstitutional academic alliance is exemplified by the Think Tank. The Think Tank is an alliance of the educational establishments of urban Phoenix, kindergarten to college levels. The goal of the Think Tank (1992) is "to use the collective resources of member elementary, high school, and community colleges within the Phoenix urban area to insure that students enter, reenter, and remain in school until their maximum learning potential and goals are realized" (p. 1).

Achieving a College Education (ACE) programs are the hallmark of the Think Tank. It is the goal of ACE (1986) "to retain students in high school, to orient them and their parents to postsecondary education, and to build the bridges necessary for successful transfer to a community college and eventual attainment of a baccalaureate degree" (p. 1). ACE alliances are complex entities involving a number of interrelated elements, including

(1) early recruitment, (2) scholarships, (3) assessment for success, (4) parental support, (5) summer institutions, and (6) a sense of family.

These programs recruit high school students between the ninth and tenth grades with the understanding that the students are entering a program that will culminate in a baccalaureate degree. Emphasis is placed on the baccalaureate degree, but ACE staff also stresses attainment of short-term goals and the development of employment preparation skills. Attainment of a baccalaureate degree is emphasized as an ultimate goal because it is a valuable credential in today's world and it is important that children and their parents not be limited in vision.

Young high school students from the middle two quartiles of academic achievement who have a desire to attend college are the main focuses of ACE recruitment efforts. Many ACE students are first-generation college students from families with limited financial resources. Each ACE student is given a small scholarship to pay the cost of tuition. Receiving a scholarship makes it possible for economically disadvantaged students to attend college and helps each ACE student realize that he or she is a special person in a special program.

ACE programs assess students after they are enrolled as a way to ascertain academic and study skills and career interests. Assessment results are used to facilitate placement in classes that are challenging but not beyond a student's ability. Remedial instruction is provided when appropriate. The ACE programs hold meetings to orient parents to the goals and expectations of the program and the parents' role in the process. Basic adult education skills classes are also made available to parents.

The programs also feature institutes on college campuses each summer as a way for high school students to become familiar with the college environment, identify career goals, and earn college credit that can be applied towards a degree. Students begin taking courses in the summer between the ninth and tenth grades and continue each summer until they graduate. Examples of the courses in which high school students enroll are (1) career planning, (2) activated learning, (3) introduction to art, (4) introduction to personal computers, and (5) introduction to sociology.

The ACE staff tries to create a sense of family among ACE students and staff. For example, ACE students are often provided name badges, T-shirts, and other memorabilia to make it easy for them to identify each other and for faculty and staff to identify ACE students.

Parenting is also involved. The staff maintains contact with students who have been recruited into the program. A computerized program has been created to help accomplish this most important task. Labeled SMASh (Student Monitoring and Alert System), this new computerized program monitors the academic achievement, attendance, and behavioral patterns of ACE students and then notifies the staff if a student appears to be having a problem. Early notice makes it possible for ACE staff to intervene in a positive way before a student is in serious trouble.

In addition, ACE programs offer college classes to high school students throughout the academic year. This makes it possible for ACE students and staff to continue their relationship while the students earn college credit. It has been the experience of the staff that ACE students prefer to attend these classes on the college campus on Saturdays. Examples of the college classes most popular with ACE students are included in Table 1.

ACE students and their parents are able to attend special financial aid classes designed to provide information on receiving aid for everything from tuition to books. The goal is to ensure that a lack of financial resources does not prevent any student from achieving a college education. The Maricopa Foundation, a nonprofit corporation that provides support to the MCCCD, coordinates this aspect of the program.

High school graduates in ACE programs enroll in highly structured community college programs that can be transferred to the three public universities in Arizona for credit. Earning a baccalaureate degree is the goal. Students must transfer to a university to complete the last two years of their program. The ACE staff does what it can to make this transfer as problem-free as possible. ACE students become familiar with the university environment by attending special orientation sessions that are held at Arizona State University, attending summer sessions at the university, or enrolling concurrently in a university and community college during their final semester at the community college.

Table 1

College Classes Taken by ACE Students During the School Year

Course Number	Title	Number of Credits
COM 110	Nonverbal Communications	3
ENG 071	Review of English Fundamentals	3
ENG 081	Freshman English Review	2
ENG 085sa	Writing Notes & Summaries from an Oral Presentation	1
ENG 085sb	Writing Notes & Summaries from a Written Presentation	1
ENG 101	Freshman English	3
ENG 102	Freshman English	3
GTC 100	Introduction to Technology	3
HIS 203	United States History to 1870	3
HIS 204	United States History from 1870	3
RDG 081	Reading Improvement	3
RDG 091	College Reading Skills	3
RDG 101	Critical and Evaluative Reading I	3
WKO 108	Work Orientation	1

It has been the experience of the MCCCD that ACE programs attract large numbers of high schools students. For example, more than one thousand high school students participated in the most recent summer institutes, and more than 420 students are currently being monitored by the SMASh program at one college alone.

While ACE programs are the hallmark of this latest interinstitutional educational alliance, the Think Tank has established a number of other important cooperative programs including (1) on-line registration, which allows high school students to receive college orientation information, be tested, be advised, and register for college courses without leaving their local high school; (2) on-line library access, which allows high school students to access the entire MCCCD library from computer terminals located in their home school libraries; (3) access to parenting literacy classes for parents of fourth through sixth grade students, which give parents an opportunity to learn the communication skills necessary to become more effective participants in the education of their children; and (4) the urban teacher corps, a program that makes it possible for currently employed, nonprofessional elementary and high school staff to complete the college and university coursework necessary for them to upgrade to professional status.

Other educational alliances have been formed, as well. "The Academic Alliance" is a national movement. In Maricopa County, this movement involves associations of mathematics, science, and English as a Second Language faculty from the elementary, secondary, and postsecondary levels. It is the goal of Alliance faculty to foster a collective responsibility for the education of all students who are enrolled in the disciplines which they teach, not just those in their particular classroom.

"The Seamless Web" is an Arizona State University-MCCCD alliance. Launched during the 1989-1990 academic year, the intent of the Seamless Web is to encourage talented minority community college students to consider matriculation to a university for completion of baccalaureate, masters, and doctorate degree programs. The long-term goal of this program is to increase the number of minority persons who become college and university faculty and who may serve as role models for minority students.

If the Maricopa experience in any way mirrors what is occurring in community colleges elsewhere across the United States, this has become the age of the interinstitutional educational alliance. Descriptions of current MCCCD programs that exemplify this advancement are included as Appendix A of this paper.

SUMMARY

The United States is a nation with major societal problems. An unacceptable number of young people fail to earn a high school diploma. A large percentage of the population is either illiterate or only marginally literate. Many citizens live in poverty, and less than twenty-five percent of all minority citizens obtain the benefits derived from postsecondary education. It will require an alliance of all citizens to create solutions to these challenges. Just as the above problems are interrelated, the reality of the situation is that all citizens of the United States share the same habitat. Whatever affects one citizen affects every citizen. It is obvious that community colleges by themselves do not have the resources necessary to address the challenges that face this nation alone, but the challenges are addressable. Business/industry education and interinstitutional educational alliances are being formed, issues are being identified, programs are being put into place, and impressive progress is being made.

REFERENCES

Achieving a College Education (ACE). (1986). *ACE: Achieving a college education, South Mountain Community College*. Phoenix, AZ: Author.

Think Tank. (1992). *Think tank mission statement*. Phoenix, AZ: Author.

APPENDIX A

OPERATIONAL INTERINSTITUTIONAL EDUCATIONAL ALLIANCES CURRENTLY COORDINATED BY THE MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT

Academic Alliances

Gail Shay of GateWay Community College is responsible for development of English as a Second Language (ESL) Academic Alliance. This is a local professional organization of teachers from elementary school through college. The goal of this program is to foster collective responsibility among area ESL teachers to increase the quality of ESL teaching and learning. Math, science, and English teachers have also organized academic alliances.

ACE (Achieving a College Education)

Stella Torres coordinates a Think Tank program between South Mountain Community College and Phoenix and Tempe Union High School District. The goal is to increase the number of baccalaureate degrees earned among at-risk high school students. Tenth grade high school students from surrounding schools attend college credit summer institutes at South Mountain Community College. Consistent personal and academic support and scholarships are provided.

ACE Plus (Achieving a College Education Plus)

Pat Brodie coordinates a new Think Tank program among Glendale Community College, Glendale Union High School District, and Phoenix Union High School District. The intent of the program is to incorporate features of the ACE program in ways that enable high school students to both matriculate into occupational programs and/or transfer to a university.

AIMES (Achievement in Math, Engineering, and Science)

Robin McCord of Chandler/Gilbert Community College Center and Saundra Minckley of Mesa Community College administer this program at their respective campuses. The goal is to recruit minority ninth grade students from nearby schools into programs that will lead to success in math, engineering, and science careers. Program components include both special high school courses that are taught at the student's home school and summer placement.

Alternative High School

Margaret Hogan is the administrator responsible for the Chandler/Gilbert Community College Center-Chandler High School Think Tank program. The Alternative High School makes it possible for students who have experienced limited success in their regular high school program to complete their high school requirements on a college campus. Guided independent study and computer-assisted instruction make it possible for the alternative school to offer any course that a student needs. The intent of the program is to reduce the Chandler High school dropout rate and increase the number of Chandler High School graduates who choose to attend the Chandler/Gilbert Community College Center.

Community College to University Articulation

Irene Wright coordinates Community College to University Articulation program for the Maricopa Community College District. The purpose of this program is to insure problem-free transfer from one institution to the other. University equivalents to Maricopa Community College's almost six thousand courses are negotiated through Wright's office and then published in an annual *Course Equivalency Guide*. The guide is then used by high school, community college, and university students, faculty, and counselors to plan transferable programs of study.

Comprehensive Regional Center for Minorities (CRCM)

Ernesto Ramirez is the director of this major new National Science Foundation funded project. It is the goal of CRCM to recruit minority students into math, engineering, and science-based programs and to provide them with the support necessary to be a success. CRCM efforts are closely coordinated with the MCCCD, AIMES, and Mathematics, Engineering, Science Achievement (MESA) programs.

Connection "The"

The goal of this South Mountain Community College project is to connect African-American students with historically black colleges and universities.

Course Credit

Willie Minor is the Phoenix College administrator responsible for coordination of the forty-eight operational course credit articulation agreements that exist between Metro Tech VIP and Phoenix College. Course credit articulation agreements are also operational at six of the sister Maricopa Community Colleges and eleven surrounding high school districts.

Crisis in the Workplace

Paul Elsner, Daniel Yanklovich, the American Broadcasting Corporation (ABC), and the *Republic* and *Gazette* newspapers are collaborating on this nationwide project. The goal is to go to the grassroots of public opinion to learn what citizens want and are willing to pay for in terms of public education.

Genesis

Nancy Jordan is the administrator responsible for this new Phoenix College-Phoenix Union High School District program. The goal of this program is to help pregnant teenage girls earn a high school diploma and matriculate to Phoenix College.

Guadalupe Learning Center

Amalia Villegas is coordinator of this South Mountain Community College program. Guadalupe is a small community on the outskirts of Phoenix in which a large number of at-risk persons reside. The Guadalupe Learning Center makes it possible for high school dropouts to acquire basis skills, earn a high school diploma, and matriculate to South Mountain Community College.

MESA (Mathematics, Engineering, Science Achievement)

Jose Mendoza coordinates this program involving Glendale Community College, Dysart Unified High School District, Glendale Union High School District, and Peoria Unified District. Minority ninth grade students who appear to have unrealized academic potential are recruited into special MESA classes that are taught in the student's home school. Classes continue during all four high school years. College scholarships, summer placement, and other incentives are included. Approximately ninety percent of all MESA alumni have scored in better than the eighty-fifth percentile of their high school graduating class, and almost one hundred percent have continued on to college.

Occupational Credential Acceptance

All of the Maricopa Community College nursing programs include in their policy statements the occupational credential acceptance program. John Bradley of MCCCD can provide information about the status of this program.

Pendergast Project "The"

Dennis Blosser coordinates the Maricopa Skill Center-Pendergast Middle School project. Seventh and eighth grade students who are at risk spend up to three hours a day at the Maricopa Skill Center where they are exposed to vocational training and complete a special prevocational curriculum.

Project Diploma

Valentia Vega coordinates the Rio Salado and South Mountain Community Colleges' program. The goals of this general equivalency diploma (GED) program is to provide high school dropouts with the remedial instruction they need to graduate with their high school class and enroll them in college-level coursework at Rio Salado and South Mountain Community Colleges.

Resource Coordination

Willie Minor is responsible for management of the resource coordination articulation agreement which exists between Phoenix College and Metro Tech VIP.

STEP (Student Technical Education Preparation)

David Annala coordinates the Think Tank program involving GateWay Community College, Tempe Union High School District, and Phoenix Union High School District. High school students complete specially designed applied academics courses that are prerequisite to technology-oriented occupational programs at GateWay Community College. The purpose of this program is to increase the science and math ability of students entering technology-oriented programs and thereby to enhance their ability to earn an associate degree, obtain a technology-based job, and further their education without duplication of time, effort, or expense.

Think Tank

Liz Warren administers the District Support Services Center office.

THE MARICOPA COMMUNITY COLLEGES AND CENTERS

District Support Services Center—P.O. Box 12239, Phoenix, Arizona 85002
Phoenix College—1202 W. Thomas Road, Phoenix, Arizona 85013
Glendale Community College—6000 W. Olive Avenue, Glendale, Arizona 85302
GateWay Community College—108 N. 40th Street, Phoenix, Arizona 85034
Mesa Community College—1833 W. Southern Avenue, Mesa, Arizona 85202
Scottsdale Community College—9000 E. Chaparral Road, Scottsdale, Arizona 85253
Rio Salado Community College—640 N. 1st Avenue, Phoenix, Arizona 85003
South Mountain Community College—7050 S. 24th Street, Phoenix, Arizona 85040
Chandler/Gilbert Community College Center—2626 E. Pecos, Chandler, Arizona 85225
Paradise Valley Community College—32nd Street & Union Hills, Phoenix, Arizona 85032
Estrella Mountain Community College Center—530 E. Riley, Avondale, Arizona 85323
Maricopa Skill Center—1245 E. Buckeye Road, Phoenix, Arizona 85034

EXEMPLARY VOCATIONAL EDUCATION PROGRAMS SERVING POSTSECONDARY SPECIAL NEEDS POPULATIONS

Carolyn Maddy-Bernstein
Zipura T. Burac
University of Illinois at Urbana-Champaign

This paper will describe the framework used for identifying and evaluating exemplary vocational education programs serving special needs populations. Other postsecondary vocational education programs that were identified using this framework during the 1990 and 1991 search will be described. Specifically, this paper will (1) discuss the critical components and characteristics of exemplary vocational education programs including administration, curriculum and instructional interventions, support services, articulation and communication channels, occupational placements, outcomes, and follow-up activities; (2) describe the exemplary postsecondary vocational education programs serving special populations; and (3) provide information on the use and dissemination of the exemplary program information.

State boards of vocational education, policymakers, heads of institutions, and researchers will find the information on the framework useful in (1) selecting and describing model vocational education programs for special needs students; (2) developing technical assistance resources; (3) strengthening inservice and preservice teacher education preparation; and (4) providing a framework to guide further research, technical assistance, and evaluation efforts. Information on the exemplary programs will be valuable to heads of institutions, program coordinators, and others who are interested in developing programs or seeking to improve present programs.

BACKGROUND

A popular means of program improvement among practitioners is learning from the successes and failures of programs similar to theirs. A recent survey conducted by the Technical Assistance for Special Populations Program (TASPP) (Burac & Maddy-

Bernstein, 1990) and a project conducted at the University of Illinois at Urbana-Champaign (Repetto, Phelps, & Markward, 1987) substantiate interest in exemplary programs and practices. Furthermore, TASPP staff have noted that information on exemplary programs is frequently requested by workshop and conference participants and through information requests received at the TASPP office. The need to recognize and disseminate information on these programs is further emphasized in the Carl D. Perkins Vocational Education and Applied Technology Act of 1990. The Perkins Act authorizes the Secretary of Education to recognize excellent and high quality vocational education programs and name them "Blue Ribbon Vocational Education Programs." The act further mandates that these programs emphasize the strengthening of the participation of individuals who are members of special populations (American Vocational Association, 1990).

For the past two decades, federal vocational education legislation has provided funding of programs and support services designed to enhance the participation of students with special needs in secondary and postsecondary vocational education programs. While numerous programmatic approaches have been attempted, few have been systematically evaluated. Most of the studies of these exemplary programs have focused on serving one particular group of students (e.g., the handicapped). Furthermore, exemplary program studies have often been solely descriptive and have seldom examined the relationships between program components and the outcomes attained by program participants and completers.

THE RESEARCH

During 1989, a major activity of TASPP was to develop a process for identifying exemplary vocational education programs serving youth and adults with special needs. A national survey conducted by Wermuth and Phelps (in press) included responses from over 350 professionals in several states working in these programs. To determine the programmatic components and criteria of such programs, respondents were allowed to choose from an array of diverse program and instructional strategies currently in use and to list additional relevant criteria.

In choosing between two general approaches for identifying effective programs, respondents favored collecting and analyzing evidence on the implementation and effects of programs significantly over soliciting nominations from knowledgeable leaders within the field. This stated preference for an analytical, evaluative process constitutes a call for change in this area. To date, most effective program studies have utilized a nomination strategy to identify and select exemplary programs. The TASPP search utilized a self-nomination strategy requiring submission of a comprehensive application which included detailed information and documentation that verified specific outcomes obtained by program participants and completers.

The self-nomination process used by TASPP to identify exemplary programs focuses on obtaining detailed descriptions of programs based on twenty components identified by Wermuth and Phelps (in press) that constitute exemplary vocational education programs serving students with special needs. Those components were developed based on an extensive review and content analysis involving the extant literature from the following sources: (1) research studies of effective vocational education programs serving students with special needs, (2) criteria and reports from state department of education studies of best practices in vocational education programs serving students with special needs, (3) literature on effective instruction, (4) federal legislative provisions, and (5) chapters from textbooks designed for teacher education courses on vocational education for students with special needs.

Once a detailed program description was obtained through the TASPP exemplary program application process, the application was reviewed and evaluated by three recognized leaders in the field of vocational education for students with special needs. Criteria for rating the programs included (1) general information, (2) demographic information, and (3) program information. Program information could be broken down into (1) strong administrative leadership and support, (2) sufficient financial support, (3) staff development, (4) formative program evaluation, (5) summative program evaluation, (6) individualized curriculum modifications, (7) integration of vocational and academic curricula, (8) appropriate instructional settings, (9) cooperative learning experiences, (10) assessment of individual's vocational interests and abilities, (11) instructional support services, (12) on-going career guidance and counseling, (13) family and parental involvement and support, (14) notification of both students and parents regarding vocational opportunities, (15) vocational educators' involvement in individualized educational planning, (16) formalized transition planning, (17) intra- and interagency collaboration, (18) work experience opportunities, (19) job placement services, and (20) follow-up of graduates and nongraduates.

Those programs receiving outstanding ratings from the review process were designated as exemplary by TASPP. Once the initial phase of the TASPP National Recognition Program was completed and programs were identified and compiled as part of the TASPP computerized information base, it was hoped that the programs recognized could provide models to strengthen inservice and preservice teacher education preparation, guide further research, and provide criteria for state and local personnel to plan new programs.

1990 Exemplary Community College Programs

Program Title: **Computer Programmer Training for the Disabled Program**
Valencia Community College
Orlando, Florida

Populations Served: Individuals with severe disabilities

The Valencia Community College Computer Programmer Training for the Disabled (CPTD) program serves students who have severe disabilities (primarily physical) through a partnership with the Job Training Partnership Act (JTPA), vocational education, vocational rehabilitation, and local business leaders. The CPTD graduate placement rate of ninety-nine percent and average starting pay of $24,000 annually are indicators of the program's great success.

The eleven-month CPTD program includes nine months of classroom instruction utilizing an integrated academic "technical" curriculum, a "professional socialization" curriculum, and two months of on-the-job-training. The academic "technical" curriculum provides the students with training in a variety of computer programming concepts and programming languages. At regular intervals, community management-level professionals in data processing and human resources volunteer their time to evaluate the participants' progress in intensive hour-and-a-half sessions. The "professional socialization" segment of the curriculum addresses appropriate ways to talk, dress, and generally conduct oneself in the business world, including writing a resume and interviewing effectively. Students must dress and conduct themselves in appropriate business fashion during the entire program.

Program Title: **Learning Laboratory for Technology and Applied Sciences**
Santa Fe Community College
Gainesville, Florida

Populations Served: Academically disadvantaged and limited-English proficiency students

The Learning Laboratory for Technology and Applied Sciences is the unique provider of academic support services for Santa Fe Community College vocational students. The lab is also the heart of a network that draws together college and community resources to offer the entire range of support services necessary for students with special learning needs. The goal of the program is to develop student potential through a comprehensive system of outreach, assessment, advisement, and instruction. During the 1988-1989 academic year, the laboratory served 1,534 students with special needs, seventy-five percent of whom either graduated or continued their education.

The program strives to eliminate gaps between students' skills and the requirements of the vocational-technical programs. Upon entry into a vocational program, students' skills are assessed, a diagnosis is made, and appropriate remediation is initiated. The diagnosis, or academic prescription, is tailored to individual needs and may include the development of reading, writing, mathematics, science, critical thinking, study and employment skills, and/or the development of language and cultural adaptation skills. Students are served in either individual or small-group instructional settings in a nurturing environment.

The college, a designated area vocational-technical center, offers supplemental vocational courses and approximately sixty-two programs leading to an associate of science degree or a noncredit certificate.

Program Title: **Boulder Valley Teen Parenting Program**
Boulder Valley Public Schools
Boulder, Colorado

Populations Served: Teen parents or expecting teen parents

It is the goal of the Boulder Valley Teen Parenting Program that every school-age mother and father have the opportunity to continue high school courses leading to graduation and acquire job skills for economic self-sufficiency. In meeting this goal, the administration and staff have enlisted the aid of numerous community agencies, obtained grants, and diligently built a program that strives to meet the educational, social, emotional, and physical needs of those enrolled.

Since beginning in 1980 with one student and one baby, the program has grown to serve sixty-five parents, thirty-six toddlers, and sixteen infants during the 1988-1989 school year. The program's teen parents are offered an array of programs and services to help them attain their educational goals. In addition to the regular programs provided in the school district, teen parents also have the benefit of health care services, including pre- and postnatal services, support services (e.g., school bus transportation for them and their children), vocational training and employment services such as assessment, and academic support services such as tutoring and basic skill instruction. Students have access to the Boulder Valley Area Technical Education Center's vocational programs and job placement counselor and the option of preparing for a general equivalency diploma (GED). An infant and toddler nursery also exist for the children of teen parents in the program.

The program's successes include the following: (1) Only two percent of the program's teen parents have children with low birth weight; (2) less than five percent have another child while in their teens; and (3) an average of eighty-five percent of the teen parents have completed school or received their GED, compared to a national dropout rate of fifty percent to sixty percent for their group.

1991 Exemplary Postsecondary Program

Program Title: **Single Parent/Displaced Homemaker Program**
Pinellas County Schools
Largo Curriculum and Instruction Center
Largo, Florida

Populations Served: Single parents and displaced homemakers

The Pinellas County Single Parent/Displaced Homemaker Program serves women who are single, separated, divorced, or widowed and in need of training in basic skills, GED preparation, and financial assistance. To help these women raise their standard of living, the women are encouraged to enroll in technical training programs that will provide a higher-than-average wage and the potential for advancement. Operated by a guidance/vocational counselor and an occupational specialist with the support of staff from

Pinellas Technical Education Center, the program offers career information and counseling, appropriate preparatory courses, and job placement services. In addition, support services provided include child care funding, gasoline allowances, bus passes, tutorial assistance, and school supplies.

Since its inception in 1986, the program has served fifteen hundred single parents and displaced homemakers. During 1989-1990 the program placed at least eighty-seven percent of its graduates in high wage jobs.

REFERENCES

American Vocational Association. (1990). *The AVA guide to the Carl D. Perkins Vocational and Applied Technology Education Act of 1990.* Alexandria, VA: Author.

Burac, Z. T., & Maddy-Bernstein, C. (1990). *An evaluation of TASPP's publications and services and vocational education of special populations issues and future concerns.* Berkeley: National Center for Research in Vocational Education, Technical Assistance for Special Populations Program, University of California at Berkeley.

Repetto, J. B., Phelps, L. A., & Markward, M. (1987). *Vocational special needs education: The what and how of providing effective technical assistance.* Champaign: University of Illinois at Urbana-Champaign, Secondary Transition Intervention Effectiveness Institute.

Wermuth, T. R., & Phelps. L. A. (in press). *Identifying components of effective vocational special needs programs: A preliminary framework.* Berkeley: National Center for Research in Vocational Education, Technical Assistance for Special Populations Program, University of California at Berkeley.

CREATING A SPECIAL PLACE FOR UNIQUE STUDENTS TODAY

Judy Rotkis
Nancy McDaniel
Hocking College

Hocking College in rural Appalachian Ohio offers unique technical programs to over five thousand commuter students from five surrounding counties and to scholarship students from twenty foreign countries. Hocking differs from a traditional college in many ways, but especially in the student mix. Although some students have been recruited from cities in Ohio through an affirmative action program, many have been in the workforce since they were teens, working for low pay because they lack education. Often students cannot afford to stop working to attend college and must support families. Although job skills are important, students have a strong desire for an education, not just job training. The college provides as broad an education as possible while still focusing on the technical skills related to career choices.

The College Entrance Examination Board's study, *Higher Education in Rural America* (Treadway, 1984), concludes that rural learners seek practical education related to their immediate needs and do better when they have coherent programs of study, not bits and pieces of a program. When women return to school, they seem to need educational programs for women only, especially in male-dominated careers. It is generally believed that education and training should be tools of empowerment for bringing about both economic and social changes in quality of life. Rural students tend to be older and have family responsibilities. They have fewer years of formal education, fewer study skills, and less confidence in their academic abilities. They also have less income and often must travel great distances to reach their campuses.

Although Appalachian women's participation in the workforce has increased, they are limited to low paying jobs (Couto, 1986). The discovery of adult education as a way out of poverty has brought thousands of women who never thought of college as a possibility for them to school. For many rural women, their socialization consisted of learning dependent roles as daughters and later as mothers and wives. Yet, the National Advisory Council of Women's Educational Programs found that rural women want to speak for themselves and have their voices listened to; they want to become independent and control their own lives (Clarenbuch, 1977).

Our Hocking College female students fit the profile of the typical rural college student described in these studies; more than fifty percent of our female students are over twenty-five years old. As we observed these women trying to adjust to college pressures and juggle the other demands of their lives, we realized we were not meeting their needs. In the spirit of offering coursework directly relevant to our students, we designed "Women in Transition," a course that can be substituted for a psychology requirement in most of our technology curricula. Since our students are attempting to complete a two-year degree program, our concern was to offer a flexible alternative that focuses more on individual needs. It is our intention to encourage these women to develop a support group, as well as to improve their interpersonal skills. It is the purpose of this paper to discuss the practical strategies we have used in our classroom with mature women.

When interacting with an older, more experienced student, it is critical for the college teacher to strive for a trusting relationship. Students may exhibit some emotional barriers because of insecurity, anxiety, low self-esteem, or the stress of increased responsibilities. In some cases, the teacher may be a generation or two younger than the student. It is not unusual to find women returning to college or even completing general equivalency diploma (GED) requirements *after* raising their families. With twenty or thirty years of life after high school, these women are ready to look after their own needs. They have learned a great deal in the intervening years, but they just have not received credits for it. Recognizing the strengths and experiences of these students will help the teacher form a trusting alliance. Caring and respect are the central characteristics that ensure the success of adult learning, according to Galbraith (1989). If one believes that learning results from an ongoing sharing of experience and information, the classroom with older students provides fertile ground with benefits for all. Open dialogue promotes sharing and trust.

We open dialogue by asking students who they are, not what they do. This is not an easy question to answer, so we ask them to look at their beginning with an exercise called "Sharing Your Past" that explores family roots (Johnson, 1986). It questions the attitudes, traditions, and lifestyles as well as the work or career experiences of a family. This group exercise encourages introspection and awareness of feelings about self and families. Students who share stories about their families will often express surprise about the similar backgrounds and hardships their parents and grandparents experienced. The class then talks about the values they learned from their families.

Other exercises draw out memories about the student's childhood with respect to values, attitudes, and opinions and lead to a formal discussion of the socialization process. All have roots in the past that may seem too difficult to stir up, but self-awareness is worth the effort. If a person claims to have no connection with a family or a past history the exercises are designed to help her work through feelings of alienation. The feedback that students give and get from each other in these exercises provides a sense of being, a sense of importance, and a sense of belonging.

Next, we urge each student to think about her personal history using a timeline (Ellis, 1985). Students record important events from their past and then plan future goals and accomplishments. Starting at birth date and ending at an anticipated death date, the timeline illustrates not only that we exist in a continuum but that we can be in control of most of the events in our lives. Important dates in the future might include college graduation, new jobs, promotions, personal goals, and retirement. To complete this exercise, it is also necessary to recognize that life is finite. As Buscaglia (1979) says, "No one is going to get out of this world alive." Often we show Buscaglia's videotape, *The Art of Being Fully Human* (1979), to get students to think about what they really want to get out of today as well as the future. It is then possible to start setting goals and planning the immediate and long-range future.

The class stresses that goal setting and time management are more useful if students have learned more about themselves through self-disclosure and self-awareness exercises and dialogue. We ask, "Where do *you* want to be five or ten years from now?" not just "What are the career opportunities in your field?" The secret is to personalize education options to fit the needs of a particular student at that particular time in her life. It is dismaying to have an eighteen-year-old freshman say he or she is in college because the parents want him or her to be a lawyer. That kind of motivation does not work with the older female student who is juggling a dozen activities to be in school and who knows what she wants out of life.

Assertiveness training is another important component of the "Women in Transition" class. Learning and practicing assertive responses solicits active participation from our adult women. We begin with identification of an individual's own lack of assertiveness in relationships. Women, socialized as caretakers and nurturers in their early lives, have to resist taking that posture while they attempt to meet their current goals. Thus, the nursing student in her forties who needs and wants the weekend to study for an anatomy or physiology test need not feel uncomfortable turning down her daughter's or son's request to babysit her grandchildren. Assertiveness training becomes more meaningful when there are pragmatic obstacles to overcome. Women, with the help of fellow students, can formulate new assertive responses to old scripts to which they have been accustomed. When the learner's personal need is identified and verbalized, she feels competent and involved in her own problem-solving; learning derived from personal interest is essential (Bauer & Mott, 1990).

One of the useful class exercises synthesizes the self-awareness, goal setting, and life plan exercises. We ask each person in class to describe some important experiences that led them to college. We made a videotape, *Reflections of Women Students* (Rotkis & McDaniel, 1990) of one typical group. On the tape one woman says, "I was a waitress, a truck driver, an oil-well roustabout, a foster parent, and now I'm going to be a nurse." There is no question about her ability to be a good nurse. The act of affirming before a support group seems to empower these women to follow through with their goals. It is an empowerment that does not come from the teacher but from sharing experiences and feelings and from the empathy displayed by women who have been there.

Perhaps teachers will say that open discussions cannot work in their classroom when they are teaching a traditional class with traditional subject matter. It may be true that one cannot spend a lot of time recognizing the individuals in class, but openness to feedback and experiences from class members will enhance a lecture. For example, discussion of what is already known by the students about a subject may spark more interest than a fifty-minute lecture on what the teacher knows. This approach does take time, but it also helps the student see why the lecture topic is relevant to them, not just that it might be on the next test.

One pitfall to this open approach may be the tendency for some students to over disclose. Talking about appropriate disclosure and curbing talkers with a time limit will help prevent monopolizers. Other students may also provide subtle feedback that they are tired of hearing the intimate details of one person's life. However, the underdisclosure of feelings by the shy student is almost as disruptive. To have one or more students who do not share feelings in a group puts a damper on discussion. It can limit trusting feelings and empathy for others. Here the instructor can encourage the individual to open a reserved area by looking for a safe subject for her to share. On the other hand, one woman admitted that she had learned a lot just by listening to the stories of others, even though she did not contribute much herself. She had been developing more self-awareness by quietly absorbing what was discussed around her. In subsequent talks with this student, she did open up and talk about an abusive childhood and marriage and the belief that she was overcoming those bad experiences and achieving success in school. More importantly, she began to exhibit a higher regard for herself than she had early in her school experience.

Some sensitive problems do exist that are worth talking about with students and other faculty. We have had older women students complain that they feel they are treated differently from traditional (meaning young and pretty) students. They feel that instead of valuing the experiences and knowledge these students possess, some faculty and staff think they must be "dumb" for not finishing school earlier or for having trouble with study techniques that the younger student picks up quickly. It is quite common to see a male teacher relate to an attractive young woman and seemingly ignore the older, possibly overweight and graying woman. Without calling this "prejudice" or "bias," we have to say it is probably a fact of life. Sometimes just being able to talk about those feelings is enough to put those feelings in the proper perspective.

Addressing faculty's insensitivity to our rural population's needs can be secured through inservice or staff development programs. Statistical indications that forty-five percent of all college students are now twenty-five years or older (Tifft, 1988) should encourage us to promote professional awareness of the concerns of our adult learners. Faculty development must focus on the nature of the learner as energetically as it focuses on the nature of a learning specialty. Convening a panel of interested faculty on adult learners is a first step in constructing a model to promote awareness of the needs of the ever-increasing adult enrollment. Through research and student interviews, such a panel could deliver needed information and awareness to other faculty members. As educators, we should be vitally concerned about meaningful teaching and learning transactions. Seeking to know and understand our adult learners, we take advice from Daloz (1986): "Like guides, we walk at times ahead of our students, at times beside them, and at times we follow their lead" (p. 237).

REFERENCES

Bauer, D., & Mott, D. (1990). Life themes and motivations of re-entry students. *Journal of Counseling and Development, 68*(5), 555-560.

Buscaglia, L. (1979). *The art of being fully human* [Videotape]. Sacramento, CA: Public Broadcasting System.

Clarenbuch, K. (1977). *Educational needs of rural women and girls.* Washington, DC: National Advisory Council of Women's Education Program.

Couto, R. A. (1986). *For a sharing of life's glories: An evaluation of the rural competencies curriculum development project of the rural communities.* Nashville, TN: Vanderbilt University Center for Health Services.

Daloz, L. (1986). *Effective teaching and mentoring.* San Francisco, CA: Jossey Bass.

Ellis, D. (1985). *Becoming a master student.* Rapid City, SD: College Survival, Inc.

Galbraith, M. W. (1989). Essential skills for the facilitator of adult learning. *Life-long Learning, 12*(6), 10-14.

Johnson, D. W. (1986). *Reaching out: Interpersonal effectiveness and self-actualization.* Englewood Cliffs, NJ: Prentice-Hall.

Rotkis, J., & McDaniel, N. (1990). *Reflections of women students* [Videotape]. Nelsonville, OH: Hocking College.

Tifft, S. (1988, October 24). The over-25 set moves in. *Time*, 90-91.

Treadway, D. M. (1984). *Higher education in rural America.* New York, NY: College Entrance Examination Board.

SECTION V
MISCELLANEOUS TOPICS

EMPOWERMENT: THE LINK BETWEEN FACULTY DEVELOPMENT AND CURRICULUM IMPROVEMENT

Peggy Ball
North Carolina Department of Community Colleges
Sharon Morrissey
Central Carolina Community College

INTRODUCTION

In 1985 the North Carolina Department of Community Colleges took a look at the effectiveness of existing departmental activities to improve the quality of instruction in curriculum programs throughout the fifty-eight community colleges in the system. Those activities fell into three major categories: (1) review and revision of curricula through preparation of competency-based guides, (2) support of professional development for faculty, and (3) the award of enrichment and upgrade grants to individual colleges for a particular curriculum. The impact of these activities was too diffuse to assess.

Over sixteen years, we at the North Carolina Department of Community Colleges had developed 110 curriculum and instructional guides which were not affecting the quality of the programs as much as we had hoped. Although the direct allocation of staff development funds to the colleges was beneficial to individual instructors, there was no noticeable impact systemwide. The 110 enrichment and upgrade grants of an average of $40,000 each certainly helped individual programs to upgrade equipment and materials. However, it began to look as if we were using our resources like firefighters—to put out, or (what happened more often) to bank the worst blazes only to see them flare up again at a later time or in another location.

CREATION OF THE CONCEPT

The more we looked at our problem and tried to design a solution, the more we felt frustrated and overwhelmed, drawing further and further away from the patchwork, disconnected system of attempts at solutions. As we drew further back, we went back to the basics to examine what we felt we knew and believed about quality in instruction:

(1) Instructors are the critical factor in quality instruction. (2) Instructors almost always know what the problems are with their programs but rarely have the time or resources to solve the problems. (3) No effective change in quality of instruction takes place without the support of the instructors. (4) One solution will not fit the variety of problems faced by so many different curricula. (5) Throwing large quantities of money at problems rarely turns up workable, replicable solutions. (6) Regulatory or punitive efforts would only assure minimum standards.

Our thinking always led us back to the instructors. The instructors were the change agents who could affect the quality of instruction in a meaningful, lasting way. How could we change the instructors or empower them to change on their own?

DEVELOPMENT OF MODEL

Putting the instructor in the center of this curriculum improvement project model to be created, we examined our restrictions. The model had to be cost effective and efficient since our funds were limited and had to affect instruction systemwide. Implementation could not be based in the state office because we did not have the staff and the project would be based too far from instructors. Projects would address a single curriculum area or a group of closely related curricula. The length of the projects would be two years to allow time for real change to occur.

Activities in the projects would address three areas: (1) curriculum development or revision, (2) professional development for instructors in their subject content area, and (3) professional development for instructors in instructional techniques and technology. Travel expenses would be provided for one instructor from each college to attend each activity. Additional instructors could attend at their college's expense. The instructors would be involved in structuring the individual projects to assure workable projects that produce real, usable, classroom-tested instructional materials and technology.

Each project would be based at and directed by a college chosen as the resource school in order to keep the project at the grassroots level and give it credibility. Each project would be staffed by a full-time director with secretarial support. The director would be an experienced classroom instructor in the target area or an experienced instructional materials developer. The director would perform four functions: (1) research the target curriculum and locate resources, (2) establish and develop a relationship with the relevant business and industry contacts statewide, (3) establish a communication network with instructors and meld them into an effective focus group, and (4) organize workshops and meetings for the instructors. Projects would be managed by a team composed of the director, an instructional administrator from the resource college, and the consultant from the Department of Community Colleges from that curriculum area. This structure would assure support at the resource college and system credibility.

The Department of Community Colleges would organize the funding system and create a management system to provide support for individual projects and for the concept systemwide. This management system would schedule projects so that there would be overlapping years of operation (i.e., some projects would be in their first year while others would be in their second year). This would assure that there would always be experienced directors to help orient new directors. In addition, the management system would assure interaction among projects through quarterly meetings. This system has allowed for extensive project sharing and for organization of cooperative activities.

The magic of this fairly rigid structure is that it creates a proven framework for the projects but also allows great diversity in the construction of the individual project. Each project director starts with the same framework of general activities. The project proposal puts walls on the framework. When the instructors become a part of the project, they may adjust the walls as they work to complete the structure. It is their building when they finish, reflecting their concerns and their heightened knowledge and skills. They create something that has systemwide visibility and impact.

We have funded fifteen projects since 1985 and each project has developed new ways to expand the model or apply it more effectively. The projects have been in the curriculum/instructional areas of criminal justice; electronics; auto mechanics; commercial art and graphics; air conditioning, heating, and refrigeration; diesel mechanics; horticulture; radiology; mechanical drafting and design; machine metal working; electrical installation and maintenance; early childhood education; industrial maintenance; and writing.

AN APPLICATION OF THE MODEL

The Writing and Technology Curriculum Improvement Project

English instructors in North Carolina's community colleges regard the Writing and Technology Curriculum Improvement Project (CIP) as the best professional development opportunity they have ever had. The CIP allows focused training in a specific area of instruction and encourages those involved to plan their own professional development activities and to write their own instructional materials. Involvement in the Writing and Technology CIP has empowered English instructors in North Carolina by offering them training in computer-assisted writing instruction and in critical thinking instruction. It has also allowed them to conduct research, develop and teach pilot courses, and publish instructional materials.

Description

For the Writing and Technology CIP, Central Carolina Community College in Sanford, North Carolina, serves as the resource college. The management team consists of the dean of general studies, the English department chairperson, the project director, and the North Carolina Department of Community Colleges consultant. The management team sets the goals for the project, and the project director implements those goals.

On the local level, the resource college used a portion of its grant money to upgrade its writing program by equipping a classroom with hardware and software capable of graphics production and of low-end desktop publishing. On the state level, the resource college provides quality professional development training for other English instructors. The grant funds pay for one instructor from each community college English department to attend meetings, workshops, and conferences offered by the project.

Project Activities

The Writing and Technology CIP activities are focused in two areas: (1) professional development and training in instructional technology and (2) research, development, and publication of instructional materials.

Professional Development

Professional development activities include statewide conferences, regional workshops, departmental workshops, and committee meetings. The workshops and conferences are designed to provide training in technology, demonstrations of applications for the writing classroom, and critical thinking instruction. Over the two-year period of the project, instructors will be able to attend three statewide conferences, six regional workshops, and other training sessions as required for specific activities. They will have the opportunity to attend thirty hours of seminars in writing instruction and critical thinking and fifteen hours of hands-on workshops in computer technology.

The Spring Writing and Technology CIP Conference is a good example of the level of inservice training and workshops offered through this project. The two-day conference focused on using computers in composition instruction. Ten presenters from universities and community colleges in North Carolina presented seminars and hands-on workshops on ways to incorporate computer technology in the writing classroom. Apple and IBM provided the hardware and software for the conference, and each vendor demonstrated instructional applications using advanced technology such as hypertext. In spite of a travel freeze in North Carolina's community colleges, 114 English instructors attended the conference. Of these, sixty-six attended at their own or their college's expense, and the project was able to pay for the expenses of the other forty-eight. Participants praised the conference because it addressed issues specific to community college English instruction in North Carolina.

Research and Instructional Materials

Primary research in writing instruction and development of instructional materials are two major focuses of the Writing and Technology CIP. Participants in the Writing and Technology CIP are involved in five research projects related to teaching writing.

The first of these projects involved course review. For the first time in North Carolina, information about all vocational and technical writing courses offered at the fifty-eight community colleges has been collected and collated. This material will be evaluated to ensure consistency, currency, and responsiveness to the technological needs of the workplace.

As a second project, two surveys were conducted during the first year of the project: one of curriculum area instructors in community colleges and one of employers of community college graduates. The surveys were used to determine the written communication skills regarded as necessary for the workplace. Included in the survey instruments were questions about critical thinking and the use of computers in workplace communications.

Third, a controlled field test to study the impact of computer-assisted composition on students' writing ability was designed and implemented by eight community college English instructors. Each instructor received release time for planning the field test and developing instructional materials. Test results and instructional materials were published and distributed to all fifty-eight community colleges.

Two projects have been funded but are not yet under way. In the first of these, six English instructors will plan and teach pilot classes for report writing with emphasis on using computer applications with advanced formatting features and graphics capabilities. The instructors will present workshops for the Writing and Technology CIP and will publish instructional materials. In the second, six English instructors will plan and teach pilot classes focusing on critical thinking in the writing classroom. The instructors will publish their instructional materials and will present workshops for the Writing and Technology CIP.

Each research project was designed and conducted by instructors involved in the Writing and Technology CIP. By identifying areas of writing instruction that need attention and by participating in primary research, English instructors in North Carolina's community colleges are affecting changes in writing instruction.

EVOLUTION OF PROJECT ACTIVITIES

In a two-year period, events and circumstances can occur which may change the direction of a project. The Writing and Technology CIP has evolved since its inception but without changing the original framework. The project director plays a big role in the evolution of a project by seeking out and taking advantage of available resources. The director makes contacts with people in business, industry, and education; locates resources; and determines how best to incorporate them into the project.

Because the Writing and Technology CIP focuses on instructional technology applications, the director of the project has worked closely with IBM and Apple to determine what technology is available and useful for the writing classroom, to develop and enhance her own skills, and to interact with state-level representatives to determine how the computer vendors can best support writing instruction in the community colleges. The vendors have responded by providing equipment and consultants for conferences and workshops and by maintaining a dialogue with the director about special projects or concerns related to writing instruction. In addition, IBM has made available several learning opportunities for Writing and Technology CIP participants including (1) a brainstorming and planning session using "TeamFocus," a networked software system; (2) training in multimedia applications for classroom instruction at the Institute for Academic Technology, a University of North Carolina–Chapel Hill research facility; and (3) training in advanced computer technology at the Instructional Technology Transfer Center at Central Piedmont Community College in Charlotte, North Carolina.

CONCLUSION

The result of the Writing and Technology CIP is empowerment of instructors. Technological training empowers instructors so that they no longer fear the computer or feel that they are inferior to their students in the knowledge of technology. Classroom research empowers instructors by allowing them to test new teaching ideas and develop useful instructional materials to share with their colleagues. Networks and support groups that develop during the project empower instructors by connecting them with colleagues who are valuable resources.

The most important benefit of participation in a CIP is that the revitalized instructors change in meaningful, lasting ways. The instructors involved in these projects gain new skills that will enable them to continue to adapt their instructional techniques to a changing world. They open up to new ideas. While the projects are not long term, the intensive training and professional development offered during the two years give them the knowledge and power they need to move to the leading edge of classroom instruction.

USING INSTRUCTOR-PRODUCED VIDEOS TO TEACH AN OPEN-ENTRY/OPEN-EXIT AUTOMOTIVE TECHNOLOGY PROGRAM

John J. Clifford
Pima Community College, Downtown Campus

INTRODUCTION

Imagine the following scenarios taking place at a college. There is a job opening for a transmission builder in two weeks, and a student would like training in transmissions during those two weeks—but it is not the beginning of a semester. The local Job Training Partnership Act (JTPA) administration wants to refer dislocated workers from declining construction and manufacturing industries for short term skill training that will enable the workers to qualify for jobs. The student services office has several students with disabilities including various physical and learning disabilities who want a practical hands-on occupational program. Can the education system meet these diverse needs? At Pima Community College, the answer is "yes."

The objectives of this paper are to (1) show how instructor-produced films and videotapes have been successfully used over the past sixteen years, (2) encourage faculty members to produce their own videotapes, (3) instruct faculty on the steps and equipment involved in producing videotapes, (4) discuss the benefits of making one's own videotapes, and (5) describe a mainframe computer-based system for flexible scheduling and maintenance of a parts system

DESCRIPTION OF THE WORKSHOP

A slide show provided an overview of the success of instructor-produced videotapes in teaching automotive classes at Pima Community College over the last sixteen years. The presentation described the set up of the automotive laboratory, its staffing, hours of operation, and the number of students handled. The description included the use of the mainframe computer for scheduling of open-entry/open-exit classes and for maintaining a parts system for all classes. To give an idea of the content and level of sophistication possible in this form of instruction, the presenter showed samples taken from over six hundred videotapes that have been produced .

The presentation covered the equipment (see Table 1) and procedure used to produce the videotapes. These steps include writing objectives, designing and building live work stations, creating worksheets, using the computer to draw graphics and animation, videotaping graphics and skill activities, and editing the rough footage into the final master copy. Finally, the pros and cons of faculty members producing individual videotapes were discussed.

Table 1

Equipment and Approximate Prices

Equipment	Price
JVC Editing Unit	$ 8,925.00
JVC 3/4" Recorder – CR 8250	
JVC 3/4" Player – CP 5550U	
JVC Editing Control Unit – RM 860	
2 Panasonic 10" Color Video Monitors – CT 1030M	$ 850.00
Laird 1450 Character Generator	$ 3,500.00
Camcorder and Tripod	$ 1,500.00
3/4" Dub Down Recorder CR 6060U	$ 1,200.00
1/2" Dub Down JVC VHS Recorder BR 6400U	$ 1,600.00
Panasonic 10" Color TV – CT 110	$ 250.00
Amiga 500 (1Meg), 2 Disk Drives, Color Monitor	$ 1,200.00
(Since the JVC Company is no longer making the 3/4" system, this is now what we are recommending.)	
JVC S-VHS Editing Package VES-41	7,426.00
JVC BR-S611U Recorder/Player	
JVC BR-S811U Editing Recorder	
RM-G810 Parallel Editing Control (JVC)	
JVC KM-1600 Y/C Switcher	$ 3,574.00
JVC SA T-400U TBC	$ 3,369.00
JVC TM 1400 SU 14" Monitor	$ 602.00
JVC KY-17U 3CCD Camera (after $500 rebate)	$ 3,932.00
Subtotal	$ 18,903.00
List Price on above items	$ 24,950.00
Tape Cost Comparison:	
3/4" MBR 60 min.	$ 19.99
S-VHS T-120 min.	$ 18.99
(Broadcast quality tapes)	

EXPERIENCE WITH VIDEO-BASED INSTRUCTION

Automotive courses at Pima Community College are being taught by instructor-produced videotapes that stress student interaction and hands-on activities. This method of delivery has been in place for the last sixteen years. The instructional methodology ties skills and theory to live simulators (automotive components). The videotapes guide the students step-by-step through component workings and assembly. After working with the components on a bench with videotaped instruction, a student must take a performance test without the tapes. To pass the test, the components must function within factory specifications. The work must be done within one and a half times flat-rate time. The student may repeat the test as many times as necessary to pass the competencies.

This teaching system allows the twelve automotive courses at Pima Community College to be offered on a competency-based, open-entry, open-exit basis. In other words, a student may sign up for a course at any time during the semester and exit from it when the objectives have been mastered. A computer program has been developed for the college's main frame computer that allows a student to sign up for one course twelve times per week, twelve courses once per week, or any workable combination in between. This flexible scheduling is useful not only for the traditional student but also for the older student who wishes to be retrained or to upgrade skills.

DESCRIPTION OF THE LABORATORY

The automotive laboratory is open forty-eight hours per week. It is staffed by two full-time faculty members, two laboratory technicians, and one simulator construction person. Approximately 350 students per semester are enrolled in the twelve courses. In one of the courses, Automotives 122, American Sign Language has been included on the tapes. It will be added to other classes this year.

The system accommodates students with different automotive backgrounds and allows each student to work at his or her own pace. Students with learning difficulties can go over the material as many times as necessary. This is one of the great strengths of the system. The twelve courses offered through video-based instruction, using 105 learning stations in the automotive laboratory, are listed in Table 2.

Table 2
Video-Based Instruction Offered in the Automotive Laboratory

Course Number	Course Title
AUT 120	Internal Combustion Engines
AUT 122	Engine Service Repair
AUT 124	Automotive Diesel Engines
AUT 125	Engine Tune-Up
AUT 128	Automotive Electrical Fundamentals
AUT 129	Automotive Electrical Component: Repair and Adjustment
AUT 132	Automatic Transmission Removal: Replacement and In-Car Repair
AUT 133	Automatic Transmission Rebuilding
AUT 136	Automotive Driveline
AUT 138	Automotive Chassis
AUT 140	Automotive Brakes
AUT 142	Automotive Air Conditioning

THE LEARNING STATIONS

The heart of this flexible system is the learning station. Each station is a self-contained unit which includes a workbench with its own parts systems and manual, a videocassette recorder (VCR) and small monitor for student viewing, and the related videotapes. The learning stations that comprise each class are grouped together in the laboratory.

The instructor develops the learning objectives for each module. The appropriate components and tools must be assembled for the workbench. The instructional videotape is then filmed and edited to include step-by-step demonstrations and learning activities.

Computer graphics and animation may be included to illustrate automotive functions. A worksheet is developed to accompany the videotapes.

THE PRODUCTION PROCESS

The steps to produce a learning packet are listed below, employing the transmission station that uses a 440 T4 automatic transaxle as an example. First, build the learning station around a standard workbench. Spread the transmission out on the bench over life-size pictures of the parts in the order of assembly. Attach a tool box with all the tools needed. Then attach a mini table to provide the student a place to write. Add the VCR and monitor so the student can view and operate them.

Next, design a worksheet to accompany the videotape. The worksheet should follow the same steps and be in the same order as the videotape to reinforce the lesson. Then, put together a parts catalog and parts system (use two or three used transmissions as a starter inventory). These starter transmissions will provide a solid base inventory to start from and add to over time.

Videotape someone putting the transmission together step by step. Make sure that what is being done and the tools that are being used are adequately described. Edit this raw footage down to a final master and put the pause signals in the places where the tape should be stopped for the student to perform the operation. Theory tapes can be produced that use the bench and its transmission as a learning tool, as well, or a separate station can be built with cutaways, graphics animation, and a workbook. In order to tie everything together, build a road-simulating tester so that the student can test the transmission.

BENEFITS OF THE SYSTEM

Video-based instruction allows the Pima Community College automotive program to meet a wide range of diverse student needs while maintaining a high quality, competency-based occupational program. The flexibility of the program enables adult working students to balance an education with their work and family responsibilities. The use of videotapes and hands-on experiences incorporates visual, auditory, and kinesthetic learning styles for the benefit of students with diverse abilities.

A summary of the primary benefits of this system is as follows: (1) Students can progress at their own speed through the courses, repeating the information as necessary. (2) Students can modify their class schedules to accommodate shift changes at work or unexpected commitments that occur in their lives. (3) Instruction starts the first day and the first hour of class. (4) Instruction is more efficient than traditional education because several small classes can be taught at the same time with no additional cost. (5) Equipment in the videotapes matches the equipment in the laboratory. (6) Videotapes are designed to include interaction so that students are involved, not just sitting and watching. (7) Students are tested on the information on the videotapes. (8) Instructors are able to emphasize important information. (9) Minor modifications such as adding American Sign Language to a tape can be made to ensure access for all students.

CONCLUSION

The video-based instructional program developed at the Pima Community College Automotive Laboratory requires time and effort to produce each learning unit, but the units provide flexibility and positive learning experiences for a large number of diverse students. Participants considering the implementation of this methodology are invited to contact the presenter or to visit Pima Community Campus to see the system in action.

JUVENILE JUSTICE COMPUTER ASSISTED INSTRUCTIONAL PROGRAM

Arthur B. Cordova
Brian Fitzpatrick
Albuquerque Technical-Vocational Institute

OVERVIEW

The Juvenile Justice Computer Assisted Instructional Program (CAIP) at Albuquerque Technical-Vocational Institute (T-VI) is using computers to teach basic skills in reading, writing, and mathematics to at-risk high school youth in the justice system. The goal is to enable participants to pass the general equivalency diploma (GED) exam, return to high school, go to work, enter the military, or continue in higher education. T-VI, Albuquerque Public Schools (APS), and the Bernalillo Juvenile Justice System are collaborating to ensure the continued success of this program. The justice system provides referrals and follow up; the public school provides transitional opportunities into and out of the program; and the community college provides the environment, instruction, and student support.

In mid-1989, the three agencies considered the findings of a study which indicated that as many as eight thousand youths in the Albuquerque area faced a nonproductive future, leading possibly to incarceration. These young people lacked basic education and life skills and knowledge of work and career options. They needed immediate intervention and positive feedback if they were to succeed. Realizing the urgency of the problem and the limited availability of funds, the two educational institutions and the juvenile justice system agreed to work together to coordinate available resources to help reverse the pattern.

ROLE OF ALBUQUERQUE TECHNICAL-VOCATIONAL INSTITUTE

The community college is the major force in this collaboration, providing a positive adult environment distinctly different from the secondary public school setting. The students' self-esteem improves, and they receive peer approval when they say they are taking a computer course at a reputable postsecondary school. They are also in an environment where they must be independent and are away from immediate peer pressures.

The program is cost efficient. Classes are conducted in a fully-equipped computer laboratory at times and days when regular instructional use is low. Computer lab aides are available as part of their regular responsibilities to the community college. T-VI provides the instructor and instructional aide with a budget of less than $10,000 per year. GED testing, counseling, and other services are available to the participants. Instructional materials and student advisement are provided by the Adult Education Program. The facility is centrally located in the city and allows easy access by most of the students. T-VI provides bus passes for those students in need.

ROLE OF BERNALILLO COUNTY JUVENILE JUSTICE CENTER

Referrals are made through the court or the juvenile probation office. Some students are ordered by the court to attend classes as an alternative to incarceration. Parole officers require some of their assigned parolees to attend as a condition of probation or parole. Additionally, juvenile offenders can attend the class in lieu of performing community service.

The Juvenile Justice Center screens and identifies the youth most likely to succeed in the program. Center staff also provide constant communication and follow up to the court system on all students. Frequently, the instructor is called to appear in court to provide the judge follow up and assessment information on students' statements; what the instructor says may have a strong bearing on the court's decision. Youth who complete the program receive substantially reduced probation or parole from the court.

ROLE OF ALBUQUERQUE PUBLIC SCHOOLS

The Albuquerque Public Schools Liaison Office, located in the Bernalillo Court Juvenile Justice Center facility, is the clearinghouse for all referrals and maintains a waiting list when classes are filled to capacity. The APS office provides advisement to students and their parents by outlining the goals of the program and explaining the referral process.

Acting on behalf of APS, the liaison office refers students who have been suspended from school or who are in violation of the New Mexico school compulsory attendance laws. The goal of APS referrals is to help students keep up with their studies and improve their basic skills and to allow suspended students to reenter school at the end of their suspension period. After students have participated in the program, the APS office provides transitional advisement for those reentering the school system.

YOUTH AT RISK

The CAIP program serves youths fifteen through seventeen years of age. Of the youth who have participated to date, eighty percent are sixteen-year-olds classified as ninth graders and seventy-five percent are males. The average student is a sixteen-year-old Hispanic male from a disadvantaged neighborhood with a history of school attendance problems. The typical student has had a negative educational experience since elementary school, is a low achiever, and does not value school or education. The average entering participant is undisciplined, is looking for the easiest way out, has been in and out of the court system since middle school, has gang affiliations, and is from a single-parent family with siblings who are also at risk.

Upon entering the program, the students are pretested. Ten percent fall below the fourth-grade reading level; thirty to forty percent are at the fourth- or fifth-grade level; forty percent are in the sixth- through eighth-grade levels; and ten percent are above the eighth-grade level. Students who are seventeen years old and score above the eighth-grade level are prepared to take the GED as soon as possible, usually within one month.

The CAIP program does not serve hard-core juvenile delinquents but focuses on youth at risk. Twenty percent are court ordered by the judge to attend; sixty percent are referred by a probation officer; ten percent have been suspended from the public schools; and ten percent are in violation of the compulsory school attendance law. Many students, understandably, start the program with apathetic attitudes; but in the course of the class, they become motivated to the extent that they elect to continue above and beyond program requirements.

THE CLASSROOM

Four classes are conducted year-round in one-hour sessions on Tuesdays and Thursdays from 3:30 to 6:30 p.m. and Fridays from 4:15 to 5:45 p.m. The computer lab has twenty-eight computers available, and the class size averages twenty-five students. The open-entry/open-exit policy allows for two hundred to two hundred fifty students to enter the classes with about one hundred fifty students being substantially served or completing the fifteen-week term of the program.

Prior to entering the class, the students, accompanied by their parents or legal guardians, are required to meet with the instructor and the APS's liaison office to discuss the objectives, rules, and procedures of the program. The students sign a contract agreeing to follow the rules, procedures, and expectations of the program and acknowledging the consequences of any violation. They are expected to behave in a way that is appropriate for the program and the community college environment. Additionally, the students agree not to miss more than five sessions at risk of expulsion. The students and the parents are told that should the student be absent from any session, the instructor will call the parent to follow up.

At the very beginning of the course, the student is advised of the results of the pretest. The student is not prescribed or placed in the computer-assisted instruction but receives an orientation to the computer and the instructional software and is encouraged to select what he/she would like to work on from the menu. This approach is different from what these young people have experienced in the regular public school. They are fully informed of their deficiencies and are given total control, choice, and an open menu from which to select and prioritize instruction. As a result, most students elect to start with their least deficient areas, giving them an opportunity to get familiar with the course and gain immediate success. As they build on this success, they become more confident and engage in the more serious deficiencies.

The student is assigned a computer and made responsible for maintaining it and explaining any damage or problems with it. It does not take long for the student to assume ownership of his/her computer. The program provides an instructional aide who assists the instructor by tutoring, individualizing, and handling special students' needs. To maintain privacy and objectivity, the aide is kept from viewing any student records. The instructor uses peer teaching by matching low-level students with advanced students. The advanced students sincerely want to help classmates, and less skilled students feel very comfortable interacting with other students. Again, students are encouraged to take control of the learning.

The software used is "Skills Bank," which contains fifteen units of instruction in reading, language development, writing, and mathematics. Each area contains three or four units, eighteen to thirty-six lessons in each unit, four to eight exercises in each lesson, three quizzes and three tests in each lesson, fifteen to twenty-five items in each quiz, and twenty-five items in each comprehensive test. The student must score eighty percent or better on each quiz and test to demonstrate competency. This software has a management system which keeps track of the progress and assessment results for every student. It is appropriate for any student above a third-grade reading level.

On a regular basis, the instructor calls the parents to provide them with feedback on the student's progress. The parents are encouraged to visit the class. Also, the parole officers visit the class regularly to monitor the students' progress.

The teacher gives numerous achievement awards to students. All students who meet the eighty percent competency on a unit are acknowledged with their name printed on a star which is posted on a bulletin board. Students with perfect attendance for the month are photographed and their pictures are posted in the classroom to recognize the achievement. At the end of the term, the student who maintained the highest average is presented a special award at the same ceremony recognizing GED graduates and other students receiving awards. Parents and friends are invited.

OUTCOMES

The program has been in place since September 1989 offering three and later four class sessions per fifteen-week term and three terms per year. During this period about one thousand students have entered the program with fifty percent meeting the objectives, twenty-five dropping out, and the other twenty-five percent continuing the program. The average number of hours completed by students who met the objectives of the program was twenty-four hours. The laboratory with its twenty-eight computers was utilized at over eighty percent of its capacity at every class session. Similarly, attendance was over eighty percent. Of the thirty students who have attempted the GED test, all have passed with an average score of 47.6; the average score for the entire community college was 44.0. They scored highest in science (49.5) and lowest in math (45.2). Students completing the program have achieved an average score of eighty percent on the computer-assisted tests and quizzes. The highest average was in the language arts area and the lowest was in the math area. To date the best average for a student was ninety-seven percent. Students completing at least thirty hours of instruction have shown an increase of one year in their reading, math, and language development level.

Of the fifty to one hundred students who dropped out of the program, fifty percent broke their probation and were back in the juvenile justice system, twenty-five percent met their objective, and twenty-five percent dropped for lack of interest, usually because of their inability to succeed in this program. In the latter group, a very high percentage scored below the fourth-grade level on the pretest.

COST

The sharing of resources and collaboration has made the program relatively inexpensive and cost effective. The computer laboratory equipment alone would have cost over $50,000, not including furniture, software, facility, and supplies. The community college contributed the fully-equipped computer lab facility, instructor, aide, software, instructional materials, student services, supporting staff, bus passes, supplies, and administrative support. The Juvenile Justice Center contributed the judge, parole officers, its facility, staff and administrative support, and supplies. The public school provided the liaison office, administrative and staff support, advisement, counseling, and registration.

The total cost of operation would be in the hundred thousands of dollars per year, but discounting the resources contributed by each of the three agencies, the only recurring cost was about $10,000 per year, primarily for the instructor and the aide. The agencies were particularly suited for this program and each plays a vital role in its success.

WHY IT IS WORKING

Through collaboration, each of the three agencies knows its role and ways to enhance the others'. The staff at each agency communicates and shares a common goal. Initially, everyone involved believed strongly in this endeavor and now can show real evidence of its success. It is extremely important to have complete commitment from all involved.

The instructor must be highly knowledgeable about the problems, characteristics, and behavior of the students. The instructor needs to be able to individualize and support the computer-assisted instruction and provide activities and reinforcements appropriate to this type of student. The instructor must also be aware of students' conflicts, such as gang affiliations, age differences, and personality conflicts. The instructor needs to have strategies and continually develop new strategies to handle apathy, incompatibility, conflicts, varied motivational levels, attendance problems, behavioral problems, and discipline. In addition, the instructor must provide a highly structured environment which is clearly understood by the student.

The computer software provides an open-entry/open-exit environment, highly individualized instruction, prescriptive teaching, quick assessment, immediate feedback, and task management. It also requires very little instruction to get started. Frequently, these juveniles have been turned off by the traditional mode of instruction in which they have little control and have continually received negative feedback. In this program, the computer is totally under the students' control and can only react to what is put in. The computer cannot stereotype students or criticize them based on subjective perceptions. Also, it cannot judge whether a student is motivated, telling the truth, rationalizing, playing games, or committed to his/her education. The students see the program as an objective and fair educational environment.

UNMET NEEDS

Although eight thousand youths could potentially benefit from this program, instructors at T-VI are able to serve only a small fraction of the population. We continually investigate ways to meet this need, and our impact with this project is noteworthy. Still, much work remains. A better system needs to be developed to track the twenty-five percent who dropped the program without meeting their objective. A needs assessment on this group would provide valuable information on how to assist these youths. We realize that no program can be one hundred percent successful, but knowing what positive changes have been made on successful students makes one more committed to helping youths who are still at risk.

PICTURES IN THE HEAD
Keynote Luncheon Speech

David L. Crippens
Educational Enterprises
KCET, Los Angeles, California

To say that we are going through momentous change in our country and the world would be a gross understatement. Ever since I was a high school student growing up in Nashville, Tennessee, I have been fascinated with the educational world and the process of change.

Changes are knocking down education's door. This is happening in many ways because of the overwhelming desire to improve it and to help insure that the standard of living in the United States remains high. In a sense, these concerns, as well as others, led to the landmark Carl D. Perkins Vocational and Applied Technology Education Act Amendments.

Outside the sphere of those in vocational education, few people have heard of the Perkins Act. This goes to the heart of the matter that vocational education, itself, is little known. And what is known is not always positive. Vocational education has been viewed as a dumping ground for minorities and the poor and a field primarily run by a "good ole boys" network.

Yet, the philosophical constructs and rhetoric of the Perkins Act view vocational education as a partnership of work and academics built on a solid foundation of basic skills. It recognizes and strongly emphasizes that all young people will need at least two years of postsecondary education to obtain a well-paying job.

One outcome of the old vocational education paradigm was a group who could be characterized as the "forgotten majority." These two words make it clear that our system of education—based on the movement of students from high school to four-year college programs—has worked well for some but missed the majority. Underpinning this concept of education is a major assumption for the future. Our society will need all of its eligible individuals to work. This sounds good, but it is difficult to implement. However, if a phrase is repeated and discussed in different circumstances and settings, it will become a part of the public's consciousness.

The late, respected columnist of the mid-Twentieth Century, Walter Lippman (1922), wrote a book entitled *Public Opinion*. In it, he coined a phrase, "pictures in the head." He believed that for public opinion to be moved to a desired end, individuals and groups must help the public develop "pictures in the head," or as I like to think of it, a common map of events and ongoing situations. The Perkins Act presents a golden opportunity to garner public support for its goal of educating all Americans, especially the forgotten majority.

As we begin to internalize the critical importance of all our young people to become contributing citizens, the new direction for vocational education will become clear. Notice, I said "contributing citizens" instead of workers. It is important that our young people not commit crimes, not be on welfare, and not be permanent wards of our society. This is one of the promises of the future system of vocational education. Connected to the rhetoric has to be a firm commitment in action to what are called "necessary skills." An excellent definition of this term comes from the Secretary's Commission on Achieving Necessary Skills (SCANS) published by the U.S. Department of Labor in 1991. The report says that to be a productive, contributing citizen, a young person must be able to competently use (1) resources—knowing how to allocate time, money, materials, space, and staff; (2) interpersonal skills—being able to work on teams, teach others, serve customers, lead, negotiate, and work well with people from culturally diverse backgrounds; (3) information—acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information; (4) systems—understanding social, organizational, and technological systems; monitoring and correcting performance; and designing or improving systems; and (5) technology—selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies.

The second part of these necessary life skills is a three-part foundation that a young person must possess to be successful in the workforce. I am sure you know these competencies by heart but let me repeat them again. They are the (1) basic skills of reading, writing, mathematics, speaking, and listening; (2) thinking skills related to creativity, decision making, problem solving, visualizing situations, learning, and reasoning; and (3) personal qualities of individual responsibility, self-esteem, sociability, self-management, integrity, and honesty. These are more than just words appearing in yet another federal report. They are qualities that can provide "pictures in the head" for the public to understand the changes that will be needed for the successful education and preparation of all young people. Our task is to define and redefine how students can bring these qualities and skills to the workforce.

It cannot be assumed that yesterday's perceptions of these skills will be relevant to today's or tomorrow's workforce. For example, much of mathematics has heretofore been taught as a group of intangible concepts to be mastered by only a chosen few. Today, reforms in the field convey mathematics as practicable and relatable to a young person's environment.

As our society has become mobile and, in some ways, more distant, personal qualities have gained greater significance. In the recent past, necessary behaviors and attitudes were once modeled and taught in the home and the community. Unfortunately, today, this happens much less frequently. Yet, personal qualities such as responsibility and honesty represent the glue that binds our workforce and society. These qualities must permeate educational programs. The discussion and illumination of these qualities can help create the common map of visions for the forgotten majority in every community across this country.

The thread that runs through the SCANS report and the Perkins Act is that we are all lifelong learners. As I commented earlier, our world is going through momentous change. One of the unintentional aspects of the Perkins Act is to prepare our young people to cope with most events caused by change.

As a television executive, my major interest is in communicating marvelous aspects of the Perkins Act to a national audience, especially as it relates to your spheres of interest. I am equally concerned about the negative perceptions of vocational education that I mentioned earlier. These can delay and even derail the intent of this recent legislation.

Community colleges also suffer from negative imagery. Just recently, "Saturday Night Live" aired a devastating skit about community colleges. It depicted a college bowl type competition between two schools. The ridicule of community college coursework took the form of describing one of the contestants' majors as "nail sculpting." What was worse, the two teams could only manage to come up with one correct answer between them. This racially mixed group of community college students represented to me the way the general public perceives the "forgotten majority." The negative "pictures in the head" must change if genuine educational reform is to occur. One avenue to help bring this about is through accountability.

Educating young people with skills and competencies is a long-term process. At times, it is not definable. Yet, we must find ways to codify what our students know and where they are in the process.

The United States has always been a society that, on the surface, demanded accountability. In fact, one of the tools in changing "pictures in the head" is to periodically report student progress to the public. It is clear to me that if you do not devise, implement, and publicize your standards, others will. An attractive element of the State of North Carolina's Tech Prep programs is their emphasis on public accountability.

The various publics fervently believe that the United States should be world class in education. Yet, there may be some question of whether we are willing to pay for that excellence. As I have previously mentioned, the Perkins Act provides part of the blueprint to achieve world class status. It is also clear that in our competitive, capitalistic country, partnerships must be formed. I know many of you have done very well with the business community.

In order to gain more attention and credibility for necessary life skills, educators need to seek to join hands with other groups who share similar interests. The mathematics community has been in the forefront in reforming itself for almost seven years. The intent is to change the way math is taught to ensure that math is user friendly. A consensus exists within the math field to foster this approach. They are now looking to publicize and join with other groups to ensure that the United States becomes among the world's best in mathematics.

Another partnership can be made with funding sources. The U.S. Department of Education and the U.S. Department of Labor are not the only national sources of funding. For example, the National Science Foundation (NSF) is a major funding source for various education projects. One of their primary interests is the reform of mathematics and science. Also, NSF is becoming the leader in funding experimental relationships between technology and math/science curricula. This includes, among others, the use of video discs and imaging. Applications for vocational education projects from community colleges are rarely seen at NSF. Preparation and money may be a deterrent. Access may be another. Perhaps another reason for the lack of application may be a perceived lack of fit within the funding guidelines of this organization. This is not true.

Please note that I have not spoken much about parents and community groups in this equation. Community colleges have done a good job in working with parents and community groups. Tech Prep and two-plus-two programs—or in lay person's language, the joining together of high school and community colleges—are easily understandable to the public. It promises strong academics, which can translate into obtaining good jobs. These programs provide tangible evidence to the public that change is a permanent part of our lives and that there is a greater variety of opportunities to learn throughout life.

Parents want to know that their young people will be prepared to succeed in the workforce. Communities want to know that programs will produce contributing members to society. These requirements may sound simplistic. We may assume these to be the end result of the most rudimentary of educations. In reality, being able to succeed and contribute represents the very least we must expect from our young people, our adult learners, and our workforce. All of these individuals are needed to ensure our leadership role in all economic, social, and political fields.

What makes the Perkins Act a dynamic blueprint for the future of education reform is its underlying philosophy that all Americans have the capacity to contribute if they are given the opportunity to learn. It emphasizes the natural relationship between academics and work and the practical application of knowledge that bridges classroom exercises to work situations.

The positive spirit of the Perkins Act must be sent to educational programs. If community college educators are to make a difference and bring about educational change, they must believe in the change. How can we create "pictures in the head" if we just mouth the words? Do we really buy into the concept and accept the responsibility of educating the "forgotten majority"? I hope you understand that we need all people to work for a simple, perhaps selfish, reason. Our monthly retirement payments will be determined by the productivity of these students. Are we really committed to creating or restructuring curricula and programs that impart the necessary competencies and basic skills that are required for tomorrow's world?

Lastly, are we willing to have educational programs held accountable to our colleagues as well as the larger community? This means that we must design and implement programs that carry forward the spirit of the Perkins Act. We also must share ideas and challenge each other to higher creative levels. What has been done in the field of mathematics can be done for vocational education.

We are faced with accomplishing some difficult tasks in a complex and sometimes crazy world. The "pictures in the head" we create for others must be visions of positive change. And these visions demand from each one of us a long look at ourselves and careful planning and unswerving commitment.

REFERENCES

Lippman, W. (1922). *Public opinion.* New York, NY: Harcourt, Brace, & Company.

Secretary's Commission on Achieving Necessary Skills (SCANS). (1991). *What work requires of schools: A SCANS report for America 2000.* Washington, DC: U.S. Department of Labor.

A FRAMEWORK FOR LEARNING ADVANCED VOCATIONAL SKILLS

John W. Schell
University of Georgia

INTRODUCTION

How do novices become experts? This is an important question for those community college educators wishing to increase critical vocational thinking and problem solving. The question should be addressed to those professionals leaping on the bandwagon bound for combined vocational and academic instruction. While many interesting suggestions for restructuring occupational instruction are surfacing, few authors seem to be giving serious thought to the reasons for these alterations. Are these suggestions based on the results of legitimate research, or are we simply seeking political solutions to problems that are psychological in nature?

This paper describes a cognitive framework that might provide a partial justification for reform. My concern is with *educating*—not *training*—workers who are thinkers and problem solvers.

The Emerging Workplace and Advanced Learning

Good jobs in American business and industry are increasingly reliant on advanced problem-solving skills. Many scholars and business persons underline the increasing need for workers of this type. Such skills might include "the ability to deal with fluid evolving and ambiguous situations in which problems must be solved given little time, incomplete information and experience" (D'Ignazio, 1990, p. 95). To perform well, modern employees must be able to solve complex problems that they have never before encountered.

These new work values are consistent with the vision of the Carl D. Perkins Vocational and Applied Technology Education Act of 1990. Under this legislation, programs of vocational education are expected to address an expanded mission, calling for high school graduates with "a loosely defined set of skills termed 'workplace literacy' " (Gray, 1991, p. 444). Many experts expect that these generalized occupational skills will be best learned through combined vocational and academic instruction (Pritz, 1989). What is needed is a cognitive framework that supports advanced learning and instruction (Schell & Hartman, in press). For the purpose of this inquiry, advanced knowledge is defined as an intermediate learning stage between introduction and practiced expertise (Spiro, Coulson, Feltovich, & Anderson, 1988).

Here the goals of learning are different. The new goal is to transfer previous learning to new applications. "The storage of fixed knowledge is devalued in favor of the mobilization of potential knowledge" (Spiro, Vispoel, Schmitz, Samarapungavan, & Boerger, 1987, p. 181). One such framework can be found in the cognitive research of Spiro of the University of Illinois. His approach, called "flexible cognition theory," seems to provide a justifiable foundation for learning and teaching complex information.

Flexible Cognition Theory: A Framework for Integrated Learning

Some research suggests that educators wishing to encourage higher-order mental skills should not base learning activities on traditional views of learning (Jones, 1990). Complex material is best mastered in its natural setting (Spiro et al., 1988). Some investigators believe that arduous material should not be reduced to simple elements for ease of teaching (Travers, 1977). They argue that "the learning of complex forms of behavior, such as the ability to reason, cannot be understood in terms of simple processes" (p. 23). The integration of vocational and academic instruction makes no sense if it does not (1) encourage deeper understanding of complex materials, (2) help learners reason with it, and (3) apply it in changeable situations. Flexible cognition theory may prove to be an appropriate learning framework that indeed encourages higher-order mental skills.

Flexible cognition is defined as "the ability to spontaneously restructure one's knowledge, in many ways, in adaptive response to radically changing situational demands" (Spiro & Jehng, 1990, p. 165). Research conducted on the use of flexible cognition theory indicates that high school control subjects, when taught materials organized as a hierarchy, could more easily recall specific material from memory. However, those in the experimental groups, learning from multiple points of view, proved more adroit at transferring learning from one context to another (Spiro et al., 1988). Similar results were obtained by Hartman and Spiro (1989) when entering college freshmen who required remedial reading assistance demonstrated significantly better reading comprehension skills following instruction based on this theory. Much of Spiro's research has been conducted using medical students as they master biomedical knowledge.

The work of respiratory therapists (RTs) is an excellent illustration of advanced decision making in a complex environment. Often, RTs deal with patients with similar symptoms that can be caused by different conditions. For example, a patient in an intensive care unit may hyperventilate due to anxiety or because of a heart attack. Obviously, very different courses of action are required. The therapist must be able to hypothesize, diagnose, test their hypothesis, and recommend the correct action to the physician.

The literature describing flexible cognition theory speaks of at least seven highly dependent variables that are important when developing advanced learning activities. Figure 1 graphically illustrates the interactive nature of the variables. Working from the outside in, each is briefly discussed below.

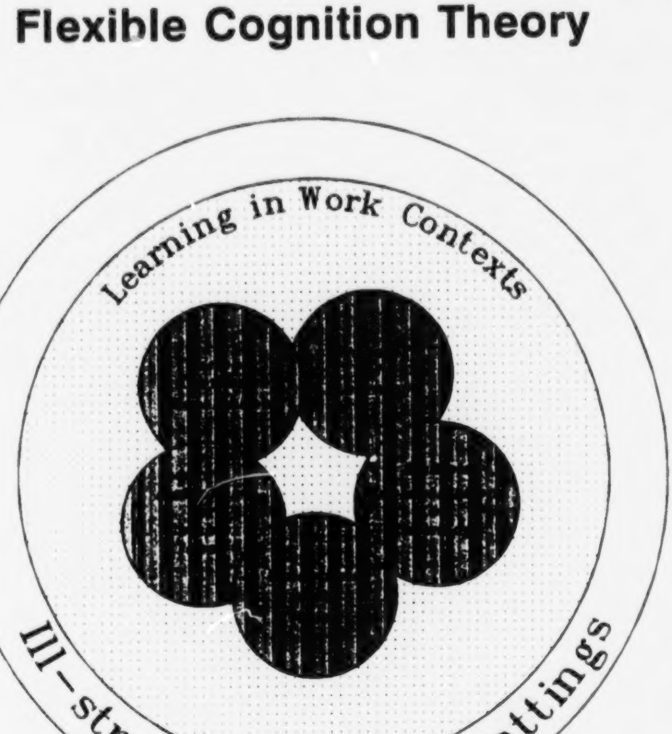
Ill-Structured Environments

These are variable settings where work problems cannot be solved using single solutions. "We call domains that have these features of content complexity and irregularity of application context ill-structured domains" (Spiro & Jehng, 1990, p. 165). The working conditions for RTs are frequently ill-structured because problems are often complex and cannot be solved using the same solution every time.

Learning within Context

Wittgenstein (1953) postulated that the meaning of information is determined by its use. Over the years, many research studies have substantiated this (Raizen, 1989, p. 32). Bransford and Vye (1989) have used these findings to postulate that "students must have the opportunity to actively use this information themselves and to experience its effects on their own performance" (p. 188). If knowledge has no apparent application, it may not be perceived as meaningful and, therefore, not readily transferable to other learning opportunities (Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990).

Figure 1


Flexible Cognition Theory
Learning in Work Contexts
Ill-structured Work Settings

Learning Transfer

The solution of complex work problems often requires workers to use previous learning in new ways. "If they don't have the opportunity to actively use this information to achieve specific goals, students often learn facts that can be recalled only in specific contexts . . . " (Bransford & Vye, 1989, p. 188). Transfer is encouraged when several learning conditions are met: (1) Technical information is connected in several ways and at different levels; (2) multiple views of complex information are allowed; and (3) learners are encouraged to make exceptions for situations where apparent solutions are not the correct ones (Spiro et al., 1988).

Multiple Representations of Knowledge

The research of Wittgenstein (1953) is the foundation of flexible cognition. His metaphor of the "crisscrossed" landscape is commonly used to represent the importance of multiple views of complex materials (Jones, 1990; Spiro & Jehng, 1990). Repeated learning opportunities promote multiple exposures to complex ideas and skills. A single exposure might highlight only a single aspect, while second and third efforts reveal new levels of detail (Spiro & Jehng, 1990). Advanced vocational learning must be based on many opportunities to examine information from many points of view.

Variable Knowledge Assemblies

Solving new problems often requires employees who can shift from retrieval of "intact, rigid, precompiled knowledge structures, to assembly of knowledge from different conceptual and precedent case sources to adaptively fit the situation at hand" (Spiro et al., 1988, p. 6). Some researchers view precompiled knowledge structures to be (1) too rigid, (2) too compartmentalized to be highly interconnected with other schema, (3) too watered down (complex data is often treated as if it were simpler than it is), and (4) too many applications of a single schema (Schell & Hartman, in press).

Allowances for Exceptions

Solving complex problems will probably require many potential solutions before an acceptable one is found (Hartman & Spiro, 1989). To be proficient at assembling ideas, learners must possess "more general skills in planning and checking one's work" (Raizen, 1989, p. 34). While other cognitive models rely on recall of intact knowledge schema, Spiro et al. (1987) believe this process to be weak in settings where problems with ill-structured solutions are routine.

Metaphors for Complex Ideas

Raizen (1989) reports that experts approach and solve problems much differently than do novices. While experts rely on "analogies to get at the basic nature of the problem, or to reinterpret it until solutions become apparent" (p. 34), novices use routine procedures built on limited knowledge. It is thought that case studies will assist novice learners in modeling expert behaviors. Spiro et al. (1988) suggest that the more unpredictable (ill-structured) a given outcome may be, the more appropriate are case studies.

The use of case studies in advanced vocational education could result in (1) establishment of meaningful links between knowing and doing (Raizen, 1989); (2) alternative vantage points for viewing a complex problem (Jones, 1990; Spiro & Jehng, 1990; Wittgenstein, 1953); and (3) encouragement for learners to assemble prior knowledge (Spiro et al., 1988), test it against a hypothesis, as experts often do (Raizen, 1989), and then mobilize the new learning for use (Bransford et al., 1990).

When the goal of learning is beyond knowledge and recall levels and learners are asked to use information in unpredictable situations to solve complex problems, flexible cognition theory seems to apply. However, complex ideas can be very difficult to organize into learning activities without the use of electronic technology. With the introduction of hypertext and the interactive videodisc, the necessary technology is finally in place to begin a meaningful investigation (Jones, 1990; Spiro & Jehng, 1990).

Hypertext and Multimedia for Learning Subjects

Hypertext was first defined by Nelson in the 1960s (Harrington, Fancher, & Black, 1990) as nonsequential writing with text that branches, allowing readers to read materials in the order of their own choosing (preferably on an interactive computer monitor) (Paske, 1990). These capabilities mean that a learner is no longer limited to normal text format. Individual elements of a body of knowledge can be electronically connected using a structure that appears as a spider web. It is thought that these webs allow the creation of courseware that emulates the associative way that the human mind seems to work (Jones, 1990).

A Hypertext Simulation for Novice Respiratory Therapists

To assess the appropriateness of these advanced learning theories and integrated learning, a hypertext simulation is being developed to demonstrate these connections. The simulation which will be used to prepare associate degree respiratory therapy students for their National Board for Respiratory Care examination employs IBM microcomputers, interactive videodisc, and hypertext course-authoring software.

Learners are first presented videodisc simulations of patients requiring RT services. Using the IBM microcomputer (with M-motion adapter and monitor), a mouse, and an interactive videodisc, the learner may examine the patient. The learner will observe such things as blood pressure, pulse rate, and respiratory sounds. After an initial examination, the novice therapist must diagnose the situation and recommend a corrective action. If the diagnosis is correct and a proper course of action recommended, a videodisc image of an improving patient is shown. However, in the event of a misdiagnosis, the learner will view the effects of their decisions. Under extreme conditions, learners will watch as their patients die.

The RT simulation integrates science and math skills with respiratory knowledge. Consistent with Spiro's theory, the simulation is based on (1) ill-structured problems, (2) learning in context, (3) learning transfer, (4) multiple representations of knowledge, (5) variable knowledge assemblies, (6) metaphors for complex ideas, and (7) exceptions to the rules.

Ill-Structured Problems

The RT simulation presents learners with several complex situations, such as patients experiencing respiratory arrest. This is a classic ill-structured predicament that cannot be resolved using the same solution every time.

Learning in Context

The RT simulation places learners in a hospital setting including intensive care and emergency room situations. To further imitate a true-to-life setting, the learning activities are timed. Often a therapist must take correct action within two to three minutes to prevent brain damage from lack of oxygen. Similarly, simulations must be completed in real time.

Learning Transfer

The RT simulation challenges learners with ambiguous situations that necessitate the application and adaptation of previously learned content. Learning transfer is encouraged because it allows (1) technical information to be connected in several ways and at different levels through its hypertext structure, (2) multiple case studies to be presented from multiple points of view, and (3) learners to make exceptions for situations that do not follow normal patterns.

Multiple Representations of Knowledge

The RT interactive program, because it is programmed using hypertext and multimedia, affords learners the opportunity to explore the simulation in a way that best suits their learning preferences. Because hypertext is nonsequential, its contents can be approached in any order. This approach allows great flexibility for the learners to progress in their own way, thus suiting their own learning preferences (to the extent this can be accomplished using interactive instruction).

Variable Knowledge Assemblies

The RT simulation furnishes learners with a computerized body of knowledge that is electronically connected. In short, these interconnections of knowledge allow students to explore the data, collecting information for the purpose of creating a new solution that fits the current situation.

Metaphors for Complex Ideas

The RT simulation uses many case studies as a standard format for presenting the learners with patients. Each patient has his or her own case history, health problem, and current vital signs. It is thought that this format will encourage expert behaviors in solving difficult problems.

Allowances for Exceptions

The RT simulation is programmed to illustrate the results of the learner's choices. It is very possible to misdiagnose a case, thus contributing to the death of a patient. To avoid this unpleasant outcome, novice RTs must be able to apply their knowledge and to be creative when solving problems. Individual learners know that these complex cases are not as simple as they appear.

EXPECTED OUTCOMES

Nationally, the field of respiratory therapy is among the fastest growing occupations. Naturally, this is of great interest to community college administrators and teachers. With these interests in mind, we expect the RT computer simulation to encourage learners to (1) establish meaningful links between knowing and doing (Raizen, 1990); (2) view a complex problem from many vantage points (Jones, 1990; Spiro & Jehng, 1990; Wittgenstein, 1953); (3) assemble new knowledge from prior learning (Spiro et al., 1988); and (4) mobilize (transfer) the new learning for new applications (Raizen, 1989).

We expect to find that novice RTs exposed to the simulation will become better solvers of complex problems. We also expect them to achieve higher scores on the applied clinical section of their National Board for Respiratory Care examinations, and to consider themselves better problem solvers on the job.

REFERENCES

Bransford, J., Sherwood, R., Hasselbring, T., Kinzer, C., & Williams, S. (1990). Anchored instruction: Why we need it and how technology can help. In D. Nix & R. Spiro (Eds.), *Cognition, education, & multimedia: Exploring ideas in high technology* (pp. 163-205). Hillsdale, NJ: Erlbaum.

Bransford, J., & Vye, N. (1989). Cognitive research and its implications for instruction. In L. Resnick & L. Klopfer (Eds.), *Toward the thinking curriculum: Current cognitive research* (pp. 171-205). Alexandria, VA: Association for Supervision and Curriculum Development.

D'Ignazio, G. (1990, September). Integrating the work environment of the 1990's into today's classrooms. *T.H.E. Journal, 18*(2), 95-96.

Gray, K. (1991). Vocational education in high school: A modern phoenix? *Phi Delta Kappan, 6* (72), 437-445.

Harrington, R., Fancher, B., & Black, P. (1990). *IBM linkway hypermedia for the PC.* New York, NY: John Wiley.

Hartman, D., & Spiro, R. (1989, March). *Explicit text structure for advanced knowledge acquisition in complex domains: A post-structuralist perspective.* Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.

Jones, R. (1990). To crisscross in every direction; or why hypermedia works. *Academic Computing, 4*(4), 20-30.

Paske, R. (1990a). Hypermedia: A brief history and progress report. *T.H.E. Journal, 18*(1), 53-56.

Paske, R. (1990b). Hypermedia: A progress report. Part 2: Interactive videodisc. *T.H.E. Journal, 18*(2), 90-94.

Paske, R. (1990c). Hypermedia: A progress report. Part 3: Cd-rom, cd-1, dvi, etc. *T.H.E. Journal, 18*(3), 94-97.

Pritz, S. (1989, August). *Basics for students at-risk: A vocational-academic approach.* Paper presented at the North Central Regional Educational Laboratory Conference on At-Risk Students, Chicago, IL.

Raizen, S. (1989). *Reforming education for work: A cognitive science perspective.* Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Schell, J., & Hartman, D. (in press). Flexible cognition theory: A framework for advanced vocational learning. *Journal of Industrial Teacher Education.*

Spiro, R., Coulson, R., Feltovich, P., & Anderson, D. (1988). Cognitive flexibility theory: Advanced knowledge acquisition in ill-structured domains. In V. Patel & G. Groen (Eds.), *Proceedings of the cognitive science society* (pp. 1-8). Hillsdale, NJ: Erlbaum.

Spiro, R., & Jehng, J. (1990). Cognitive flexibility and hypertext: Theory and technology for the nonlinear and multidimensional traversal of complex subject matter. In D. Nix & R. Spiro (Eds.), *Cognition, education, & multimedia: Exploring ideas in high technology* (pp. 163-205). Hillsdale, NJ: Erlbaum.

Spiro, R., Vispoel, W., Schmitz, J., Samarapungavan, A., & Boerger, A. (1987). Knowledge acquisition for application: Cognitive flexibility and transfer in complex content domains. In B. K. Britton & S. M. Glynn (Eds.), *Executive control processes in reading* (pp. 177-199). Hillsdale, NJ: Erlbaum.

Travers, R. (1977). *Essentials of learning.* New York, NY: Macmillan.

Wittgenstein, L. (1953). *Philosophical investigations.* New York, NY: Macmillan.

HEALTH CAREERS OPPORTUNITY PROGRAM: SUMMER INSTITUTE 1991

Linda Shields
Margaret Thompson
El Paso Community College

El Paso is located on the far western tip of Texas, bounded by the U.S.-Mexican border and the state of New Mexico. Of the 600,000 inhabitants in the District's service area, sixty-two percent are Hispanic, twenty-nine percent of whom live below the poverty level. Approximately seventy-five percent of those over twenty-five years of age have not completed high school, and only eight percent report any education beyond high school. Persons under eighteen years of age account for over thirty-five percent of El Paso's population. Consequently, many students at El Paso Community College (EPCC) are young Hispanics from low-income families and with little or no experience dealing with a postsecondary educational environment.

The Health Careers Opportunity Program (HCOP) is a funding program from the Health Resources and Services Administration. The objectives of the program are to identify, recruit, and facilitate the entry of individuals into the health professions education program and to implement retention activities once students have matriculated. The focus of this paper will be the development and implementation of the Summer Institute, including the recruitment and selection of students for participation.

High school recruitment activities included career days, classroom presentations, and tours of campus laboratories and local hospitals. Local television and radio presentations, community health fairs, and career fairs provided exposure to a broader population. Current students in EPCC health programs assisted in these activities using brochures, book covers, videos, and other attention-getting displays. In this way, information on HCOP and health careers reached 6,230 interested individuals. Recruitment activities brought in 509 initial applications, of which eighty-nine were completed to include (1) a high school and/or college transcript or general equivalency diploma (GED), (2) a letter of recommendation, (3) parents' 1990 tax return, and (4) a 350-word biosketch, "Why I wish to be part of the health professions."

These eighty-nine completed applications were reviewed by a selection committee composed of the HCOP Coordinator, HCOP Counselor, Health Occupations Division chair, and two faculty members. The criteria used in the selection process reflected the characteristics of the population to be served by HCOP, genuine interest in health careers, and academic and personal qualifications. A rating scale with a weight for each item in the criteria provided a scoring system for the evaluation process. The criteria were evaluated in the following order: (1) minority status, (2) first generation American origin, (3) financial need, (4) previous or present enrollment in vocational and technical courses, (5) grade point average, (6) biosketch, (7) letter of recommendation, and (8) potential for success.

Following the selection committee's evaluation of the eighty-nine completed applications, forty-four individuals were accepted into HCOP. Of these, thirty-nine completed the 1991 Summer Institute. The Summer Institute is five weeks long with the students attending academic classes from 8 a.m. to 5 p.m. Monday through Friday. Saturday is designated as "field trip" day. The Summer Institute is designed around an academic/instructional component and a motivational component.

The academic component provides intense short-term instruction to enable students to progress beyond remedial levels or to move up within the remedial range in math, English, reading, and biology. In addition, it introduces medical terminology, use of computers in health, and concepts of chemistry.

The motivational component is intended to enhance the career decision-making process by providing an atmosphere of cohesiveness for the group and a broad overview of and exposure to the health care professions. The goal is to motivate the students toward success in meeting their goals.

To determine the effects of the instructional component, the instructors used pre- and posttests in English, math, reading, and biology. The EPCC testing program was used for placement of students in either remedial or college level courses. The ASSET test, developed by the American College Test Service, was used for math and English; the Nelson-Denny was used to establish a grade level for reading; and an EPCC comprehensive test was used for biological concepts. These tests were administered by the EPCC Testing Center and were also a part of the admissions process for new students.

Posttests were administered in classrooms on the last day of the Summer Institute by the instructor for each subject. The Nelson-Denny was again used for reading. The written portion of the English placement test and the final exams from biology and math instruction served to place the students for those subjects.

Results from the pre- and posttests indicated definite improvement in academic skills with many students scoring above the remedial levels. Pretest scores in reading allowed fifty-six percent of the students to exit the remedial level (9.8 grade equivalent); whereas following the instruction provided in the Summer Institute, seventy-seven scored above the remedial level. Also, prior to participation in the Institute, only twenty-eight percent met the 12.0 grade equivalent, compared to sixty-two percent after the Institute—an increase of thirty-four percent.

In English, twenty-six percent of the students had already moved into college level courses by completing previous coursework. Another two percent tested into the college level English course on the pretest, leaving seventy-two percent in need of remedial work. However, after the Summer Institute, posttests allowed forty-six percent to move into the college level course with only twenty-eight percent needing remedial courses.

Biology pretests indicated that seventy-four percent of the students needed a prerequisite to anatomy and physiology, while the instruction in the Summer Institute reduced this number to thirty-five percent as shown by posttest results. Results from the math pre- and posttesting were not as impressive as the others. Upon pretesting, seventy-four showed a need for basic math; posttesting showed that fifty-nine percent still needed this course. This indicated an improvement of only fifteen percent. However, within the range of remedial courses, thirty-one percent of the students progressed to the next higher level course, even though nearly six of ten still were not ready for college level math.

For many students, the improvements are the effects of a refresher course since nearly all had instruction in these subjects in high school. The intense instruction during the Summer Institute provided a boost to many students who would have been required to spend at least one semester in remedial courses upon entering EPCC. In HCOP they had the opportunity to recall, relearn, and refresh their academic skills and to retest for placement purposes.

Immediately following the Summer Institute, nine students (six of whom had previously attended EPCC) enrolled in the second summer session. All nine students carried a full load of at least six hours for the five-week session, and were enrolled in at least one subject in which they had instruction during the Summer Institute. Eight of the nine students made grades of A and B, and the other student passed all three courses with Cs. The instructors are very pleased with the results of the summer session and are eager to see what the fall semester will bring.

Also, we believed the motivational component of the Institute was working. The students attending the summer session became more motivated because they had a definite educational goal. They were part of a select group with a common interest in health occupations, and they had encouragement and support from the HCOP personnel.

So far during the fall semester, we have noted that numerous HCOP students come by the HCOP office just to say hello, and some spend time between classes in the HCOP office visiting with each other and our secretary. The cohesiveness has carried over, and the students feel that they belong to a group and have a place of their own on campus. The results of the Summer Institute feed into our advising process for placement in English, math, reading, and biology, as well as other courses in the individual degree plans. Various concerns included in the advising process are (1) Texas Academic Skills Program status (TASP); (2) testing in math, reading, and writing mandated by the state of Texas; (3) remedial activities required for any section not passed; (4) transfer credit; (5) previous EPCC coursework; (6) ASSET test scores; (7) EPCC placement test for new students; (8) biology placement test; (9) SAT or ACT test scores; (10) Summer Institute posttest; (11) articulation credit from high school; (12) personal concerns; and (13) degree plan.

Preparation for entering most of EPCC health occupations courses usually takes at least one year, so students normally spend the first year taking academics required by the degree plan, including English, math, anatomy, physiology, and psychology. The actual program courses include clinics or practicums at the hospitals in the community. A few students were prepared to go right into their program courses and clinics following the Summer Institute because they either had previous college coursework or were enrolled in a program which does not require prerequisite academic courses. The Summer Institute is important because it bridges the gap between high school and college level academics.

Increasing the number of minority and disadvantaged practitioners in the health and allied health professions is an integral part of the overall strategy for improving access to and quality of health care for underserved citizens. Health care shortages exist throughout the country and are expected to become critical by the year 2000. The minority and disadvantaged population bears the brunt of untimely deaths, chronic diseases, substance abuse, homicide, and infant mortality. The demand for trained health care personnel has further increased with the rise in catastrophic diseases such as AIDS.

The shortage of health professionals has been well documented in recent articles and reports. The shortage of qualified minority health professionals is more acute and represents a major problem for states such as Texas. To meet the workforce demands of the year 2000 and beyond, Texas must provide innovative programs that will prepare minorities and women for these and other careers. Consequently, no issue is more important to contemporary higher education than establishing model educational programs that address the need to prepare health professionals and other technologists for the immediate and future workplace.

DEVELOPING FACULTY COURSE PLANNING SKILLS WITH AN ARTIFICIAL INTELLIGENCE SOFTWARE PACKAGE: THE SECRETS BEHIND AN EXPERT SYSTEM

Daniel E. Vogler
Thomas Leitzel
Virginia Polytechnic Institute and State University

INTRODUCTION

Faculty can improve instruction by following the principles of performance instruction outlined by the expert system in an artificial intelligence approach to course design and implementation. Performance instruction is the planning, delivering, and evaluating of learning and teaching. Based upon the Vogler Curriculum-Pedagogy-Assessment (CPA) model, the bywords of performance instruction are "effectiveness" and "efficiency." Performance instruction can be created manually or with the aid of three software packages that form an integrated or independent software suite.

The planning phase of performance instruction requires that course content be communicated in advance. The output of planning is a course syllabus with eight distinct elements, including a header, course description, course focus, course content goals, student contributions, evaluation, schedule, and performance objectives. The syllabus is designed for students and must be provided before instruction begins. The delivery and evaluation phases produce instructional lesson plans and criterion tests.

Peaks CourseBuilding™ software is the leading artificial intelligence (AI) application software package for course planning. The CourseBuilding™ software produces a syllabus. The software guides and monitors the user while it aggregates key decisions. The expert system embedded in the software is both dynamic and passive. The system is dynamic by providing the infrastructure for the development of the syllabus and is passive by providing a prescriptive manuscript that can be accessed by the user. Flexibility is enhanced by allowing the user to override default-based decisions.

This paper will describe the following five functional components in the software: (1) establishing credit parameters, (2) developing content goals, (3) sorting content goals, (4) writing performance objectives, and (5) formatting course syllabi.

ESTABLISHING CREDIT PARAMETERS

Peaks CourseBuilding™ software is designed to equate content, time, and credit. Accepted units of credit recognized by accrediting agencies are the basis for the equation. Three hours of aggregated in-class and out-of-class learning time per week equals one credit hour. The user designates the weeks in the term and the number of hours per week for lecture laboratory and clinical and outside work.

DEVELOPING CONTENT GOALS

The user is urged to develop a content goal for each three hours of student learning time. Content goals are the communication devices that specify the outcomes of performance instruction. The syntax of a content goal is controlled to maximize clarity and to provide the basis for aggregating information. The final format of a content goal is a sentence that will be five to nine words in length. The subject is the generic phrase "the student will." The subject is followed by a present tense action verb, zero to four adjectives, and a direct object.

An example content goal is "The student will identify equilibrium points." This example, from an introductory economics course, includes the present tense action verb "identify." The verb can be classified as cognitive and at the factual level. The choice of the verb, object, and adjectives set the stage for delivery and evaluation. The user will need to make subjective judgment regarding the length of time that the student will invest to learn the content. Ideally, this should be a three-hour learning time investment. The revision of any part of the content goal may change the time required. The expert system will bypass the syntax to help the user complete sorting functions and the performance objective.

A logic train is established that promotes solid and clear communications. The logic train asks, "What will the student do?" The answer is that the student will *identify*. "What will the student identify?" The answer is that the student will identify *points*. "What kind of points will the student identify?" The student will identify *equilibrium* points. Thus, the content unfolds with a present tense verb, a direct object, and adjectives. The logic train forces the words to be entered in a set sequence, thereby permitting the creation of verb, object, and adjective files. These files are valuable for content analysis and alignment.

SORTING CONTENT GOALS

Each content goal is scrutinized to answer the following four key questions:

1. What is the content adding to the course?
2. How did the content get into the course?
3. Why is the content in the course?
4. When should the content be introduced in the course?

These four questions are dealt with through domain/level, frequency/difficulty, purpose, and chronology sorts. The responses to these sorts build a macrobase of decisions related to the content of the course. These decisions are aggregated for later use in the delivery and evaluation phases of performance instruction.

Domain/Level

The user identifies the domain as cognitive, psychomotor, or effective and specifies the level of content. Each domain has three levels, from simple to complex. Naturally, content with a higher level will require more time to teach and learn. Domain and level are linked to the verb within the content goal. As a consequence, the software's expert system recommends the decision for the user. The decisions made at this stage will affect delivery and evaluation decisions. In simpler terms, cognitive content will be taught differently and evaluated differently from psychomotor or effective content.

Frequency/Difficulty

The user is asked to indicate whether the content is of a low or high frequency and whether the content is of a low or high difficulty. The answers to these questions form a two-by-two matrix that can be used in the abstract to decide if content should remain or be removed from the course. The sort also infuses a key element necessary for logic checks across the other sorts. Upon completion of this sort, the user can make enlightened revision decisions, including or excluding course content.

Purpose

The user is asked to indicate whether the content is foundational, crucial, remedial, or enriching. These categories provide useful information regarding the reasons content is included in a course. The crucial and foundational categories should make up about eighty percent of the content. Crucial content is a subset of foundational content, and any goal classified as crucial must be met to pass the course. Generally, there should be no more than ten percent content in the remedial and enriching categories. Remedial content should be closely scrutinized to make sure that it has not been taught in another course. This category is helpful in providing institutional integrity of content. The enriching category is intended for the very adept student who desires to go beyond normal expectancy levels. The category is also used by the AI package to make logic checks and helps to ensure that content is appropriately sorted.

Chronology

The chronology sort forces the user to make prerequisite and preference decisions. The user will usually print the content on an index card. The procedure causes the user to determine if specified content must come before or after other specified content. The result is a map of the course that reads from top to bottom and left to right, just like a page of written material. Numerical and alphabetical codes permit the computer to order the content per the user's determined prerequisites and preferences. A horizontally configured course is more flexible than a vertically-oriented course.

WRITING PERFORMANCE OBJECTIVES

A performance objective is a communication device that specifies content; details quantity, quality, efficiency, and durability standards; and specifies the conditions under which evaluation will take place. The content goal represents one third of a performance objective. Consequently, the user has already completed one third of the task of writing the objective upon completion of the content goal wording.

The verb and the direct object are manipulated by the computer to develop the other parts of the performance objective. The quantitative phrase is created by extracting the object from the content goal and adding a helping verb and the past tense of the verb: "points is/are identified." The qualitative standard phrase is created by transforming the verb to a noun and adding a tangible document: ". . . and the identification is consistent with __________." The computer creates the following performance objectives by manipulating the syntax, verb, and object templates: (1) The student will not be allowed references. (2) The student will identify equilibrium points. (3) Performance will be satisfactory if points are identified and the identifications are consistent with the text. Several editing points permit the user to embellish the performance objective. Thus, the structure is consistent while flexibility is permitted.

FORMATTING COURSE SYLLABUS

The remainder of the syllabus can be quickly assembled from the work already completed. The header is assembled from earlier input. The course description will be a replication of the description in the institutional catalog. The course focus will be created by the user. The course goals are already completed. Student contributions will include a standard statement of outside or assignment expectations. The course evaluation will be a point-based system linked to individual content goals. Course schedules will automatically indicate the contact hours per week. Performance objectives will be assembled in a separate addendum.

Although the developmental order is different from the final output, the computer will align and format the entire syllabus as it should be presented to the students. The user has override privileges to the structure created by the expert system. Additionally, the user can easily tailor the syllabus to meet individual and specific needs using default and editing functions.

SUMMARY

The CPA model is the foundation of the expert system for three independent or integrated software packages. This paper has presented the boundaries that make up the expert system. The Vogler model will work without the software, but the software will guide the user, monitor user decisions, and aggregate decisions. While the benefits of the system are many, three primary benefits accrue. The system tutors the user in correct course design, postures the user for quick revisions to the course design, and provides a standard that promotes consistency within the curriculum.

REFERENCES

PEAKSolutions in collaboration with Vogler, D. E. (1991). Peaks coursebuilding software. Eden Prairie, MN: IPSI.

Vogler, D. E. (1991). *Planning performance instruction*. Eden Prairie, MN: IPSI.

SECTION VI
ROUNDTABLES

HOW TO SPELL VOCATIONAL EDUCATION WITH THREE "Rs": INTEGRATION OF OCCUPATIONAL AND ACADEMIC EDUCATION

Ethan Allen
Gloria Garner
Spokane Community College

The Northwest Accrediting Association has mandated that relevant education courses be integrated into all vocational programs. Relevant education requirements fall into the following three areas: (1) human relations and leadership, (2) computation, and (3) communications. These requirements can be fulfilled by offering approved established college courses or by identifying embedded material found in specific classes within existing programs. The State Board for Community Colleges for the State of Washington has also recently required that all vocational programs include elements of safety, work ethics, and leadership. While these elements are not to be the focus of specific courses, these elements need to be identified individually by indicating the course(s) (by title and number) in which they are addressed. These requirements are challenging vocational faculty and administrators to address wide-range program revisions.

The primary purpose of this workshop was to provide vocational faculty and administrators with the information needed to facilitate thorough and viable program revisions. Areas of emphasis included (1) guidelines for curriculum revision, (2) infusion of related education requirements, (3) faculty workloads and their effect on program revisions, and (4) the creation of the typical student schedule.

THE INTEGRATED THINKING SKILLS PROJECT: TEACHING TEACHERS TO TEACH THINKING

Diane D. Cheatwood
Community College of Aurora

Faculty members at the Community College of Aurora, Colorado, have infused these thinking strategies into a variety of courses across the curriculum: (1) solving difficult problems, (2) decision making with confidence, and (3) mapping elusive concepts. The Integrated Thinking Skills Project (ITSP), started with an exemplary program grant from the State of Colorado, helps instructors analyze and practice new teaching strategies for teaching thinking skills and course content.

ITSP goals are to (1) infuse thinking skills into a variety of courses, (2) analyze and apply methods for teaching thinking skills, (3) construct transfer applications to use thinking skills outside of classroom, (4) provide a friendly and supportive environment for faculty to grow as teachers, and (5) create a paradigm shift from teachers as fonts of information to teachers as coaches. Methods used to help the faculty successfully complete the ITSP project include faculty workshops, peer coaching, and continuous support from administration.

Faculty members practice the model of interactive learning during workshops. Defining thinking skills is the first task. Selecting, experiencing, and evaluating specific thinking skills is then preliminary to combining thinking skills and subject content. Faculty members write content and thinking skills objectives, design classroom activities, construct and modify instructional materials, implement teaching strategies, and assess the potential for student learning.

Peer coaching by team members helps faculty avoid a "sink or swim" approach to teaching thinking skills. Working together, members plan the most effective teaching strategies and then observe each others' classes while students practice the skills. The collegiality produced by working with faculty from different disciplines helps start ongoing support of the project.

Continuing support of the program can be formal or informal. Each semester a new workshop is offered to ITSP participants. The *Teaching for a Change* newsletter highlights ITSP activities and resources and is sent to all Community College of Aurora faculty members.

As part of the Community College of Aurora Faculty Development Program, the ITSP helps faculty move from teacher-centered instruction toward learner-centered instruction.

TEACHING WITH THE FOURTH "R": INTEGRATION OF OCCUPATIONAL AND ACADEMIC EDUCATION AND DEVELOPMENT OF OCCUPATIONAL/TECHNICAL FACULTY

Robert S. Clark
Mary E. Myers
Spokane Community College

Spokane Community College is a comprehensive institution funded for approximately 5,300 full-time equivalent students. Recent curriculum revision efforts in all vocational programs have identified the developmental needs of occupational faculty members and instructors in communication and computation. Although the identification, tailoring, and presentation of the three "Rs" to occupational students is provided by faculty members from those departments, the package needs a fourth "R" (reinforcement) within the occupational programs curricula. The development of this reinforcement component by occupational faculty began by verifying the need for the three "R" skills. The major thrust of this verification was the statewide baseline assessment project, which established that thirty-seven percent of surveyed employers were dissatisfied with one or more of the adaptive skills (writing, spelling, math, reasoning, and prioritization) of community college graduates.

The primary instrument utilized for local identification and verification of support components is the data pathway. Primary (program) instructors use data charts to substantiate the material that needs to be presented by support (communication and math) instructors. These data charts serve as the documentation for the communication between the primary and support faculty. This communication is two-way from the primary instructor to the primary subject matter and from support faculty to primary faculty so that skills can be reinforced within the primary program. Methods of reinforcement may include having students (1) write warranty letters, service letters, and service schedules; (2) complete computer time sheets, flat-rate scales, inventory, and order requirements; (3) write clinical reports and case histories; (4) compile bid sheets and specifications; and (5) read blueprints. Within the program, the method of evaluating these exercises must be equivalent to that of other math and communication projects.

INTEGRATION OF ACADEMIC AND OCCUPATIONAL EDUCATION AT EASTERN IDAHO TECHNICAL COLLEGE: A PRACTICAL APPLICATION

Kenneth Erickson
Eastern Idaho Technical College

PROGRAM DESCRIPTION

Eastern Idaho Technical College offers a comprehensive schedule of technician-level training programs which have provided highly skilled employees for U.S. Department of Energy sites and for nuclear power contractors located throughout the United States. The college offers Associate of Applied Science degree options in Radiation Safety Technology, Process Technology, Chemical Laboratory Technician, and Quality Assurance. In addition, a certificate of applied science is offered to graduates of the college's Nuclear Security Training Program. These Associate of Applied Science degree programs provide students with both technical competencies and a solid foundation of academic training which will enable graduates to find gainful employment and pursue lifelong learning. The program is further described in Table 1.

Table 1

Components of Applied Science Degree Programs

Course Content

- Academic General Education Core Courses—English, Economics, Human Relations (12 credits)
- Occupation Specific Courses—for example, Hazardous Materials Regulations, Sampling and Analysis (33 credits)
- Math and Science Courses—Chemistry, Physics, Algebra, Trigonometry, Calculus (15 credits)
- Supervised Work Experience (8 credits)

Enrollment Data

Current Enrollment of Students in Pursuit of a Certificate or Degree	160
Average Age of Students	27
Percentage of Students That Are Women	40
Percentage of Students Receiving Financial Assistance	51

Partnerships with Industry

- Operational and Research Funding
  - U.S. Department of Energy, ID Office (DOE–ID)
- Supervised Work Experience Sites
  - Westinghouse Idaho Nuclear Company, Inc.
  - EG&G Idaho, Inc.
  - Argonne National Laboratory
  - Rockwell–INEL (Idaho National Engineering Laboratory)
- Affiliate Faculty
  - INEL
- Laboratory Equipment
  - INEL/DOE–ID
- Continuing Education
  - Industry Specific Upgrade and Preparatory Training
  - Customized On-Site Training
  - Workplace Literacy Training

INSERVICE EDUCATION NEEDS OF PART-TIME BUSINESS FACULTY

Susan L. Faulkner
Virginia Polytechnic Institute and State University

A survey instrument was sent to part-time business faculty in five states to determine faculty's inservice education needs for developing instructional skills. Twenty-four community college campuses in Virginia, North Carolina, South Carolina, Georgia, and Florida participated in the survey. Information was sought on the demographic characteristics of part-time business faculty, the reasons these individuals worked as part-time business faculty, and the need for instructional skills of part-time business faculty.

A total of 138 (63.9%) part-time business faculty returned a sixty-two-item questionnaire. The average age of the respondents was 44.7 years, and 59.2% had a master's degree or higher. The average number of years of full-time teaching experience was 1.6 years, and the average number of years of part-time teaching experience was 5.5 years.

Most of the respondents (62.2%) stated that they taught as a part-time business faculty member and held another position of thirty-five hours or more a week. Another group of respondents (13.3%) indicated that they taught part-time but were seeking full-time teaching employment. Approximately eighteen percent of the respondents had a variety of reasons for teaching which could not be placed into a category.

The respondents who taught part-time and held another position of thirty-five hours or more per week indicated a need for enhancing instructional skills in the areas of (1) new teaching methods, (2) communication with full-time faculty[a], and (3) part-time faculty benefits.[a] Part-time business faculty respondents who stated they were interested in full-time teaching employment indicated a need for enhancing instructional skills in the areas of (1) part-time faculty benefits,[a] (2) computer-aided instruction, and (3) new teaching methods. Finally, the uncategorized part-time business faculty respondents indicated a need for enhancing instructional skills in the areas of (1) new teaching methods; (2)

---

[a] These statements were indicated by respondents in the "Miscellaneous" category.

instructional methods selection; and (3) use of feedback from students, supervisors, or peers.

Part-time business faculty respondents from all three of the categories had two common instructional skill needs among the top ten ranked. These instructional skill needs were keeping up with new teaching methods and identifying student learning differences.

INSTITUTE FOR PROFESSIONAL DEVELOPMENT OF PART-TIME OCCUPATIONAL INSTRUCTORS

David L. Goetsch
Occupational/Technical Education
Okaloosa-Walton Community College

The Institute for Professional Development of Part-Time Occupational Instructors at Okaloosa-Walton Community College focuses on preparing professionals to teach the technical skills they possess. The Institute consists of five instructional modules. The first is an orientation module that covers the administrative and logistical information part-time instructors need to know. Topics covered in this module include (1) student evaluation of instructors, (2) the part-time faculty handbook, (3) the college catalog, (4) accident prevention and reporting procedures, (5) midterm and final grade procedures, (6) field trip procedures, and (7) reporting requirements.

The other four modules correlate with the four-step teaching approach as follows: (1) preparation, (2) presentation, (3) application, and (4) evaluation. The preparation module assists part-time instructors in learning to prepare lessons, the facility, themselves, and the students for effective instruction. The presentation module teaches part-time instructors to present a lecture, conduct a demonstration, conduct question and answer sessions, and use a variety of instructional strategies and equipment (e.g., overhead transparencies, slides, videos, interactive laser disks/videos, and computer-assisted instruction). The application module helps part-time instructors learn to prepare meaningful activities and projects that require students to apply what they are learning. The evaluation module covers testing and evaluation, including the purposes of testing, characteristics of a good test, test construction, testing for knowledge, testing for skills, nontesting evaluation techniques, and assigning grades.

Each module consists of a three-hour workshop, and one institute is provided per semester for a total of three institutes per year. The modules which make up each institute are offered on five consecutive Saturday mornings. Each module is taught by an experienced full-time occupational instructor from the college's faculty. Participants completing the institute are assigned a full-time instructor who serves as a mentor. Part-time instructors are not required to complete an institute in order to teach, but they are given incentives to participate. For example, part-time instructors who complete all five modules are given a stipend and the title Associate Faculty Member as opposed to part-time instructor. In addition, part-time instructors who complete the institute are given first priority when classes are scheduled. Okaloosa-Walton Community College has provided the Institute for three years. To date, seventy-five percent of all part-time occupational and technical instructors have completed the institute.

The primary instructional tool for the Institute is the handbook *Learning How to Teach: Self-Paced Modules for Part-time Vocational Instructors* (Goetsch, 1984). In addition, each module has been videotaped to allow participants to complete modules missed, to spend additional time on modules, or to begin modules between institutes.

Student evaluations of instruction monitored over the past three years suggest that completers of the institute are more effective instructors than those who have not participated. Instructors who have participated in the Institute also receive better evaluations than previously received.

REFERENCES

Goetsch, D. L. (1984). *Learning how to teach: Self-paced modules for part-time vocational instructors*. Arlington, VA: American Vocational Association.

TRAINING FOR THE DEVELOPMENT OF TECH PREP

Robert C. Harris
Indiana University

If Tech Prep programs are to realize their full potential, faculty development is an essential component of the planning effort. There are at least five reasons for investing resources and time into faculty development. First, a foundational concept of Tech Prep is faculty collaboration. Yet, independent creative efforts have often characterized the work of our most successful instructors/teachers, and institutions have rewarded this behavior. Second, a supportive institutional environment for Tech Prep is essential, and this environment must be shaped by faculty and administration. Third, a common focus with shared commitments by faculty is important. This focus must be molded by mutual participation in common challenges and development of shared insights. Fourth, Tech Prep is not a new subject in the curriculum; it is a new perspective on teaching established subjects. Essential subject matter is taught through new methods and measured against new criteria. Fifth, unlike the new math or new biology curricula of the 1950s and 1960s, Tech Prep does not have a well-planned single curriculum supported by slick publications; rather, Tech Prep will be individually created at each institution. It will reflect the unique perspectives of the planning team and the institutions cooperating in the venture. Therefore, the objective of the faculty development is not indoctrination but the facilitation of a creative team effort.

The assumptions noted above suggest features of a faculty development program. The model envisioned is an inservice program designed for established faculty. Inservice education and planning and development should be viewed as interwoven, not sequentially phased activities. The program should be institutionally driven and external resources should be tapped as needed—not a program driven by external agencies. Also, the methods for acquiring these new skills and insights should model essential Tech Prep concepts. For example, participants should acquire these insights through cooperative learning methods.

A FACULTY DEVELOPMENT MODEL

The faculty development model includes the following five critical areas: (1) refinement of the Tech Prep concept, (2) team building, (3) curriculum development, (4) instructional strategies, and (5) Tech Prep program implementation. These themes are briefly developed below.

Refinement of the Tech Prep concept should proceed from tentative diverse ideas about what Tech Prep is to a refined program specific to each institution. While these concepts are being explored, it is important to bring perceived concerns, cautions, and opportunities to light. Assessing institutional readiness for Tech Prep is an equally critical activity which will lead to concrete strategies for affecting change. A result of these experiences will be a clearer perception of the developmental challenge and the faculty's role as change agents.

The focus on team building involves the development of a common purpose for the Tech Prep effort through open communication, trust, respect for differences, commitment to change, and risk taking. A number of group activities should be planned which allow team members to encounter differences and reflect on techniques for working effectively with these challenges. Understanding one's own style of participation will be equally important.

The two cornerstones of the Tech Prep concept are performance-based content and the integration of content across disciplines around common competencies. While these two perspectives must be held by all team members, the backgrounds of faculty on such perspectives are clearly different. For example, the traditional scope and sequence of mathematics content is based on the structure of the discipline, not its real world applications. Beyond understanding these essential perspectives, the team must develop a strategy, plan, and criteria for its curriculum planning work.

While the instructional strategies of Tech Prep are not new, their adaptation across four subject areas is clearly demanding. The success of the strategies will depend on the close collaboration of team members. The four instructional strategies which require specific attention are (1) application of instructional techniques which recognize different learning styles, (2) infusion of cooperative learning techniques, (3) emphasis on problem solving methods, and (4) incorporation of application-based learning activities.

The Tech Prep faculty must be supported by sound institutional commitment to the Tech Prep program. At the minimum, this commitment must recognize the administration's role, partnerships with business and industry, secondary/postsecondary interinstitutional commitments, the essential relationship of recruitment and advisement of students to the Tech Prep program, and the allocation of resources. While the team must understand its relationship to these components of the institution's Tech Prep program, the training effort must involve key actors from each of the components.

The success of this country's Tech Prep initiative will depend on many factors, including sound faculty development. The model discussed in this roundtable reflects important perspectives about Tech Prep and assumes that the faculty development program is an integral part of the institution's planning effort.

IDENTIFICATION AND DISSEMINATION OF ARTICULATED TECH PREP: PRACTICES FOR AT-RISK STUDENTS

James L. Hoerner
Darrel A. Clowes
James C. Impara
Virginia Polytechnic Institute and State University

PURPOSE

The purpose of this research is to examine the practices and processes of articulated Tech Prep programs that provide the connective tissue between secondary and postsecondary education systems and to identify alternative models and strategies that work for a broad array of clientele, including at-risk populations.

PROJECT OBJECTIVES

The stated objectives are to (1) identify operational criteria for Tech Prep; (2) determine the present status of Tech Prep; (3) develop a taxonomy for Tech Prep, which includes clientele served, institutional connection processes needed, programs involved, and strategies used; (4) identify enhancements and barriers to institutional cooperation; (5) identify alternative models and strategies for the broad array of at-risk students; (6) identify specific incentives for recruiting and retaining at-risk students; and (7) disseminate information and recommendations.

PROJECT ACTIVITIES

The project activities will include the following: (1) conduct a review of literature, (2) conduct a national survey, (3) conduct selected case studies, (4) develop a taxonomy, (5) describe the success models for at-risk students, and (6) develop a monograph.

STATUS

As of the writing of this paper, the following research tasks had been accomplished: (1) development of survey instrument (Spring 1991), (2) mailing of three hundred eighty instruments with one hundred eighty returned to date (June/July 1991), and (3) beginning of case study writing. The findings to date are listed in Table 1.

Table 1

Findings of Tech Prep Research to Date

Literature

- Most at-risk students do not reach postsecondary education.
- Community colleges do serve many at-risk students.
- The most hospitable sector of higher education for the at-risk student is a Tech Prep program.

Survey

- Approximately 50% of those surveyed are just getting started in the Tech Prep program.
- Approximately 50% of those surveyed have been in operation a year or more and have some graduates in at least one occupational program.
- Approximately 50% of the respondents indicated activities for at-risk students.
- Only about 30% indicated having an evaluation plan.

STRATEGIC PLANNING: CHARTING THE COURSE

Linda Luehrs
El Paso Community College

Personnel at El Paso Community College recently shared ideas and experiences on the approach used for strategic and operational planning in the occupational programs in the college and the community. Although the importance of planning and the benefits that can be realized through strategic operational planning are known, people often become overwhelmed by the "how-to"s and the time required. Through the charrette process, an interactive model for planning, effective long-range planning can be accomplished in a one day setting. The charrette process allows for input from a diverse constituency that can provide a multitude of ideas and resources to address the comprehensive issues and concerns that occupational education is facing today.

In preparation for the day's activity at El Paso Community College, charrette objectives and expected outcomes were developed by a planning team. Resource material relevant to the program was compiled and disseminated to participants prior to the charrette. Material included demographic trends, economic data, historical information, planning assumptions, and guiding questions. Participants were selected and assigned to small groups of approximately twelve people. An overall facilitator and small group facilitators were selected.

The agenda involved the development or revision of the program mission statement and broad goal statements. The second task involved outlining needs regarding small group assignments. In a nursing charrette, small groups focused on articulation, financial issues, legislative issues, accreditation, continuing education needs, problems with faculty groups, and student retention. The last task for the small groups was the development of implementation strategies. Each small group assigned a recorder and presenter to report briefly to the large group at the end of each session.

The planning team gathered all the ideas and information generated during the charrette process. A draft plan was compiled and distributed to all of the participants for their comments, which are incorporated into the final draft.

As constraints on resources continue to grow, a well-documented vision with accompanying goals and action plans will be even more essential for occupational education. Occupational areas need to anticipate the future needs of the changing communities they serve and develop innovative strategies to meet these needs. As a result, a fair share of limited resources can be requested.

The charrette process offers a dynamic setting which allows individuals interested in planning a program the opportunity to develop a comprehensive design which can produce a positive result within a very short time frame.

AMERICAN COLLEGES AND UNIVERSITIES OFFERING COURSEWORK ON TWO-YEAR INSTITUTIONS: RESULTS OF A NATIONAL SURVEY

D. Barry Lumsden
University of North Texas
G. Bryan Stewart
Tarrant County Junior College, Northwest Campus

In the United States today there are 2,127 public and private four-year colleges and universities. Over 1,200 of these institutions (fifty-six percent) have undergraduate kindergarten through twelfth grade teacher education programs (Doyle, 1990). More than 500 of these 1,200 schools also have graduate programs for the advanced professional preparation of public school educators. Within this group of graduate schools and colleges of education are eighty-seven colleges and universities with graduate programs in higher education. Translated, approximately 17.4% of all graduate programs in education in the United States are involved with the training of future higher education administrators and faculty.

Approximately thirty-two to forty-six higher education programs offer students the opportunity to specialize in community and junior college education. This means that roughly ten percent of all graduate programs in education offer specializations in community-junior college education. This is particularly interesting and noteworthy considering that community and junior colleges comprise 40.4% of all American postsecondary institutions and the number of two-year college faculty approaches 300,000. These statistics fail to tell the whole story.

This research had five primary objectives: (1) to develop a complete and up-to-date list of American colleges and universities which offer graduate-level coursework for teaching in two-year institutions, (2) to identify by course numbers and course titles what these institutions offer, (3) to identify geographic variations in institutions offering graduate-level coursework for aspiring and active two-year college educators, (4) to examine the kinds of graduate institutions offering coursework for educators in two-year institutions, and (5) to develop a taxonomy for classifying the graduate coursework being offered individuals interested in learning about community and junior colleges.

The graduate catalogs of colleges and universities listed in the following reference works and serials were obtained: (1) *Directory of Graduate Programs*, Volume D, Social Sciences, Education, 12th Edition (1990 & 1991); (2) *The ASHE Membership and Higher Education Program Faculty Directory* (Fall 1990); (3) *The Study of Higher Education: A Profile of Graduate Doctoral Programs* (1991); (4) "Opportunities in Community College Education," *Community College Review*, Volume 9, Number 3 (Winter 1981-1982); and (5) "Opportunities in Community College Education," *Community College Review*, Volume 11, Number 4, (Spring 1983-1984). Each of the more than two hundred fifty graduate catalogs received were carefully searched for courses dealing restrictively and exclusively with two-year colleges. For courses to be included in the study, both their course titles and descriptions had to make reference to two-year community or junior colleges. Unless seminars listed in the catalogs were specifically labeled as seminars on aspects of two-year institutions, they were eliminated from consideration. Also eliminated were higher education practica, internships, and independent studies of an unfocused or unspecified nature.

The procedure for developing a taxonomy for classifying coursework identified was an inductive one. The full-range of courses to be cited and discussed was examined for commonalities and differences.

The 1987 Carnegie classification of institutions includes all colleges and universities in the United States. These 3,389 schools were grouped according to the ten-category Carnegie institutional taxonomy.

Thirty-two (27.6%) of the institutions offering graduate-level coursework relating to community and junior colleges were categorized as "Research Universities I." The second institutional category was of "Comprehensive Universities I" with twenty-nine schools (25.9%) offering graduate instruction relating to two-year colleges. The third largest group of schools were "Doctorate-Granting Universities I," which accounted for 21.6% (n=25) of all institutions included in the study. "Research Universities II" comprised 15.5% (n=18) of the colleges and universities in the study. Finally, eleven (9.4%) of the schools in the research were "Doctorate-Granting Universities II."

The colleges and universities offering graduate-level coursework on or about two-year schools were further classified according to the regions of the country in which they were located. The proportion of American institutions in the south is 32.5% and in the west is 17.4%. In the Midwest are 25.9% of all American institutions, and the remaining 24.2% of schools are located in the northeast.

The courses identified appear to fall into four categories: (1) general, (2) administrative, (3) instructional, and (4) miscellaneous. The data presented makes it clear that higher education and community college education as fields of study have not become part of most American colleges and universities. It is a rare college which puts a share of its resources into either adult, higher, or community college education. This means that those of us in higher education will do well in the 1990s just to maintain the current situation.

REFERENCES

Doyle, W. (1990). Themes in teacher education research. In W. R. Houston (Ed.), *Handbook of research on teacher education* (pp. 3-24). New York, NY: Macmillan.

THE NATIONAL NETWORK FOR CURRICULUM COORDINATION IN VOCATIONAL AND TECHNICAL EDUCATION: THE NETWORK THAT WORKS

Richard C. Makin
Oklahoma Department of Vocational and Technical Education

In the early 1960s, participants in a federally funded project began discussing ways to coordinate the activities of the already existing state vocational education curriculum laboratories. It was recognized that a substantial duplication of effort resulted from each state working independently to achieve relatively common goals. In response to this situation, the National Network for Curriculum Coordination in Vocational and Technical Education (NNCCVTE) was established in 1972.

WHAT IS THE NNCCVTE?

The NNCCVTE is a discretionary program funded by the Office of Vocational and Adult Education in the U.S. Department of Education. It consists of six regional Curriculum Coordination Centers (CCCs) and a network of State Liaison Representatives (SLRs). The SLRs represent their individual states or outlying areas and are the links in the network. This linkage gives vocational educators access to curriculum materials from the CCCs and assists them in developing curriculum and instructional materials.

HOW DOES THE NNCCVTE WORK?

The NNCCVTE works through a network of human resources and an electronic database. The four primary components of the NNCCVTE are (1) SLRs, (2) CCCs, (3) the Vocational Education Curriculum Materials (VECM) database, and (4) the Directors' Council.

State Liaison Representatives (SLRs)

The SLR is designated by his/her state director of vocational education. This appointment is usually given to a person who has decision-making responsibility for curriculum in his/her state. The SLR is a liaison between a state's vocational education division and the CCC of the NNCCVTE. The SLR also may be the state vocational coordinator, state curriculum coordinator, state curriculum lab director, research director, or contract administrator.

Curriculum Coordination Centers (CCCs)

The six CCCs provide services to meet the curriculum needs of vocational educators and trainers. Curriculum resources, information, and research are disseminated through the CCCs. These materials are acquired through the network's sharing policy.

Vocational Education Curriculum Materials (VECM) Database

The VECM database is designed to aid in conducting searches for CCC patrons. The database contains information about vocational and technical education curriculum materials, which are publicly-sponsored and therefore generally not available through the Educational Resources Information Center (ERIC). The database can be searched by title, year, sponsoring agency, state developer, subject matter, education level, intended user, and student target population.

Directors' Council

The Directors' Council, composed of the six CCC directors and one ex-officio member from the U.S. Department of Education, coordinates the activities of the NNCCVTE. The council meets twice a year to plan strategies and formulate policies to assure cohesiveness for the network functions.

HOW CAN YOU ACCESS NNCCVTE SERVICES AND RESOURCES?

NNCCVTE services and resources can be accessed by calling an SLR or CCC. During the call, information will be taken that will assist in meeting the patron's request. Within a few working days, the materials will be sent directly to the patron at no cost and are available for use for four weeks. The telephone numbers of the six CCCs are listed in Table 1.

Table 1
Curriculum Coordination Centers (CCC) Contacts

CCC	Director	Phone
East Central	Rebecca Douglass	(217) 786-6375
Northeast	Martha Posci	(908) 290-1900
Southeast	Rebecca Wilkes	(601) 325-2510
Midwest	Richard Makin	(405) 743-5162
Northwest	Bill Daniels	(206) 438-4456
Western	Lawrence Zane	(808) 956-7834

FACULTY DEVELOPMENT STRATEGIES FOR MEETING THE NEEDS OF SENIOR AND NOVICE OCCUPATIONAL FACULTY

Elaine Mohn
Chemeketa Community College

Senior and novice occupational faculty members are experiencing numerous difficulties within academia. Senior faculty who have taken a sabbatical to earn an advanced degree often experience stifled creative energy prior to their eligibility for another leave. Novice faculty are struggling for academic survival as a result of role confusion, inadequate preparation, insufficient employee orientation, and minimal faculty development opportunities. Novice faculty in this position often leave the field or continue struggling in isolation.

Both faculty groups have much to offer each other, but a structured program is necessary to bring them together. The following four strategies bring senior and novice faculty together in ways that meet both parties' needs.

First, a faculty development committee should be established. For this committee to succeed, it must be developed and managed by faculty, supported by the administration, and include both senior and novice faculty. In addition, faculty-perceived risks need to be reduced to foster participation on the committee.

The faculty development committee's work can be enhanced by utilizing the Situation-Target-Proposal (S-T-P) Model of problem analysis. This model fosters closer scrutiny of the current and target situations. Frequently a faculty development committee assumes it understands the real problems without conducting an in-depth analysis. Moreover, the same unsatisfactory solutions are generated unless all options can be considered. To foster each member's participation in the analysis, the nominal group technique (NGT) is recommended for each step in the S-T-P Model. This technique involves the preparation of an exhaustive list of possible problems. Through a participative discussion, problems are eliminated and/or synthesized into one or two causes of the problems. All of this is done prior to an analysis of the solutions for that step. Although this is a lengthy process, the ultimate result is a thorough analysis of the problem and of possible solutions.

An example of a collaborative strategy is the development of a yearlong orientation program for novice faculty. Senior faculty can use their experience to develop a faculty handbook outlining key points. The novice faculty members who have been employed for a year or more can highlight those areas which are most confusing to new faculty members. In addition, senior faculty can act as mentors during the orientation process. Senior faculty should have a partial reduction in their workload to devote the time necessary to assist novices.

Senior faculty members' pedagogical expertise can be utilized by establishing them as in-house teaching/learning consultants to assist novice and peer faculty members. Their sense of worthiness is increased while others benefit from their knowledge.

TECH PREP IN TEXAS: AN IMPLEMENTATION STRATEGY

Carrie Hughes Nelson
Texas Higher Education Coordinating Board
Community and Technical Colleges Division

BUILDING A MODEL TECH PREP PROGRAM FOR TEXAS

In 1986 the leadership in Texas recognized that the combination of dwindling state resources and the demand for economic diversification required the development of a system designed to promote economic growth by matching regional education and training programs with the needs of local employers. A system of twenty-four regional partnership committees composed of representatives from education and training providers and the private sector was formed to achieve an integrated education and training delivery system for technical and vocational education that prepares students for area occupations. These committees constitute a strong partnership basis for Tech Prep consortia as they plan for program implementation.

The critical issues that have shaped the tri-agency state policy for Tech Prep program design and implementation include (1) questions of access and quality, (2) deliberations of a 2+2+2 model project users group, and (3) results of an external evaluation of federally funded 2+2 pilot projects.

A joint statewide committee, representing secondary and higher education practitioners and business and industry and assisted by staff from the tri-agency partnership, has developed guidelines for the development of Tech Prep programs. Ten of the most critical elements of the Texas Tech Prep associate degree program design outlined in these guidelines are (1) a comprehensive career development and guidance program for students beginning no later than grade seven; (2) both a four-year high school Tech Prep graduation plan beginning in grade nine and consisting of a coherent sequence of courses that is transferable statewide and a two-year sequence of postsecondary courses consisting of a transferable core of technical and academic courses; (3) dual credit (high school and college) for selected high school technical courses; (4) the use of applied teaching methodology in all courses including the integration of technical and academic competencies; (5) industry-driven, cooperatively-developed, competency-based technical courses that have been restructured to eliminate duplication and to streamline instruction; (6) minimum of grade level academic courses; (7) a multiple-entry, multiple-exit program design that provides access to all potential students, including technical leveling courses; (8) an advanced skills component for the community college curriculum; (9) meaningful work-based learning experiences including cooperative education, internships, clinical rotations, and apprenticeships; and (10) delivery of comprehensive and ongoing joint professional development activities for secondary and community college teachers and counselors.

The tri-agency long-range strategic plan for the statewide institutionalization of Tech Prep associate degree programs is composed of four main phases: (1) Phase I—initial consortium planning, (2) Phase II—initial implementation, (3) Phase III—full institutional implementation, and (4) Phase IV—ongoing comprehensive statewide evaluation. Supplemental statewide professional development activities, information dissemination strategies, and data collection systems will be critical to the success of this initiative.

TEACHING FOR SUCCESS: A FRESH APPROACH TO PART-TIME FACULTY DEVELOPMENT

Jack H. Shrawder
Pentronics Publishing

Pentronics Publishing of Champaign, Illinois, has recently completed phase one of its goal to create a National Teaching for Success Program (NTSP). The foundational goal of this effort is to provide colleges with an effective, print-based faculty development program designed to help college faculty and teaching assistants to improve their performance in the classroom.

Pentronics' inquiry into the practice of college teaching has determined that competent instructors must master an expansive array of complex skills for which they have had little or no formal training. The NTSP concept was born out of the need for fledgling full-time and part-time faculty to rapidly yet inexpensively acquire basic teaching skills and for experienced faculty to continually upgrade their instructional techniques.

The NTSP features sound, meaningful content coupled with a flexible, low-cost delivery method. The six major teaching competency spheres incorporated into NTSP include (1) leadership, (2) management, (3) instructional design, (4) evaluation, (5) content analysis, and (6) communication. To ensure that the NTSP can be delivered rapidly and economically to diverse instructor populations, Pentronics created an unique eight-page, monthly training letter called *The Adjunct Mentor*. This special training publication is designed to be easily duplicated by any institution after purchase of a duplication license. Pentronics can also deliver preprinted copies available at discounted group subscription rates.

Recent analysis of Pentronics' annual reader survey and feedback from several participating four-year and community colleges suggest that *The Adjunct Mentor* is a workable and cost-effective vehicle for delivering Teaching for Success methods to isolated instructor groups, such as part-time faculty and teaching assistants. For example, over eighty percent of the instructors who returned the *Mentor's* annual reader survey indicated that reading *The Adjunct Mentor* encouraged them to try new instructional ideas and increased their interest in teaching. Over sixty percent reported that using NTSP ideas helped them to become more successful teachers.

Since the content of the NTSP is obtained from three separate yet parallel knowledge areas, it provides an unmatched instructional development program. The first knowledge area focuses on what college members faculty report they have learned from the classroom experience about good teaching practices. The second source addresses what constitutes good business training practices as acquired by human resource developers and business and industry trainers. The third knowledge source is the research literature in the fields of education and psychology. By combining information from all three of these sources, faculty members receive tips and techniques that are at the leading edge of the teaching field and are applicable to a wide variety of teaching situations.

Colleges using the NTSP secure several important benefits for their faculty and students. First, networking faculty to a source of information on teaching improvement motivates instructors to want to further improve their teaching skills. Second, part-time instructors and teaching assistants feel more connected to the teaching profession as they read how professionals across the country are solving instructional problems. Third, and most importantly, when instructors are positively motivated to improve their teaching, students receive the benefit of better organized courses, more effective instruction, and more valid evaluations. Since the NTSP provides developmental information continuously throughout the academic year, it serves to reinforce in-house staff development activities, ensuring that colleges receive the most benefit possible for each dollar spent on faculty development. Finally, the NTSP is a tangible symbol to part-time faculty and teaching assistants that their needs are taken seriously.

In order to evaluate the ability of the NTSP to meet the faculty's need for instructional development, order a free review copy of *The Adjunct Mentor* by calling Pentronics Publishing at (217) 356-6651 or by writing

Pentronics Publishing
P.O. Box 97
Champaign, IL 61824

JOB SEARCH TECHNIQUES: A REQUIRED COURSE FOR THE ASSOCIATE DEGREE

Merilynne Smith
Hocking Technical College

Students, particularly those at the two-year college, often become frustrated when it comes to beginning a job search. Hocking College, with a student body of approximately five thousand students and programs in over thirty areas, is proud of its hands-on approach to the technologies and of its job placement record. Assisting students receiving an associate degree is the course "Job Search Techniques." This course is made as technology specific as possible.

Directors of each technology area were asked to submit information to the committee to enable teachers to help students tailor their materials to their specific fields of study. Each program director was asked to submit (1) résumés that are relevant to the particular technology and that illustrate the format and qualities of an effective résumé; (2) cover/application letters, acceptance letters, rejection letters, and other follow-up letters which reflect letter writing forms, materials, and ideas that are acceptable; (3) a description of the most important information related to job search techniques in the technology; and (4) answers to questions submitted by the committee on job search techniques particular to the technologies (e.g., clothing to wear on an interview).

The class meets for one hour per week throughout the quarter and carries one hour credit. It covers the following areas: (1) the initial search (i.e., analyzing strengths and weaknesses to determine appropriate positions), (2) the résumé, (3) letters of application, (4) interviews, and (5) other job search correspondence (e.g., thank you, acceptance, and rejection letters).

The class currently gives each student a letter grade upon completion. In the beginning, students did not take the class very seriously, convinced that they would graduate into the arms of recruiters offering $30,000 salaries. As a result, the committee received permission to revise the course syllabus and allow the students to earn a letter grade. Individual instructors have the option of deciding what grade must be earned in order to pass the class. Most require a minimum grade of a C on each assignment, the justification being that very few people who submit poor résumés will get hired in today's job market.

Another change made in the program has been to stress that a student should not take the class until at least the next-to-the-last quarter in school. Too often students were taking the course as a filler the first or second quarter of enrollment. At that point, they did not have specialized training to include on the résumé, internships to list under experience, or names to include as professional references. Students were not prepared to begin a job search and nothing in the class meant a great deal. Also, by the time the students were ready to begin a serious search, they had forgotten what they had been taught. Instructors have found students to be more adequately prepared when they take the course closer to graduation. The students at that point are more sure of the specific type of work they want to do. They also have more to list on their résumés and have made professional contacts who can serve as references. By taking the course in the next-to-the-last quarter, they have their materials ready to begin a serious job search as the last quarter begins.

Students taking the course are appreciative of the direction and of the individual help they receive in tailoring their résumés and letters to their individual needs, abilities, and experiences. Many students believe this course has made the difference in getting a job.

RELEVANCY IN THE CLASSROOM: USING CURRENT MEDIA TO TEACH READING, WRITING, AND CRITICAL THINKING

Merilynne Smith
Hocking Technical College

Once a student finishes a class, most textbooks are immediately sold back to the local bookstore, tossed on a top shelf, or donated to a church rummage sale. Suppose there were a textbook that some students would continue to use throughout their lives and that would provide them with ways to expand their knowledge as their interests and abilities changed. Suppose also that this textbook would help them relate things they read to their personal lives and would be cheaper than any textbook that is currently being used.

Some of the most undervalued, inexpensive, and relevant sources of material for classroom texts today are frequently overlooked as being either insignificant, immature, or nonacademic. Yet these same materials often capture students' attention, provide resources to teach skills, and help students see the relevance of these skills. These materials also help students develop lifetime reading habits that will provide continuing education and unlimited opportunities in the future.

What are these ideal texts? They include the newspapers, magazines, and television shows with which students are usually familiar. Because students are not intimidated by these forms of text, there is a greater chance that they will make them a part of their lives.

These materials are generally available at special classroom rates. In addition, many publishers offer a variety of support services for teachers using their materials. For instance, *Newsweek, Time, U.S. News and World Report*, and even *New Yorker* are actively involved in furnishing materials and support to teachers throughout the country in both high school and college classrooms. In addition, many of the metropolitan and national newspapers regularly sponsor Newspaper in Education (NIE) Week and a variety of workshops and materials to help teachers effectively use the newspapers in all classroom levels and subjects.

I first began using the newspapers in a classroom in Mississippi while working in a general equivalency diploma (GED) program. The majority of the students read on a mid-elementary level and only looked at the newspaper to check the local sports scores or police report. We used a variety of activities that helped students develop math, reading, writing, speaking, and critical thinking skills while planning shopping lists, preparing for current events competitions, conducting surveys, and writing responses to articles in the paper. The students became aware of the differences among some of the political candidates, and some of them registered to vote. They began to develop an understanding of geographic concepts when given directions like "locate Iran on the map and the globe." One advantage to using the media is that they can be read by students at all levels. We kept a variety in the classroom, ranging from the metropolitan papers to the *National Inquirer*. Some newspapers we subscribed to, while others were donated by individuals or stores in the area.

As students became more involved with these current materials, they began to see a connection between their reading materials and their own daily lives. They would occasionally bring additional materials to class either to discuss with others or to read during free reading time. They discussed with their family members some of the things they read, and the influence of these materials went beyond the classroom.

One might ask what this has to do with college classes. First of all, many colleges today offer remedial classes for both the underprepared recent high school graduate and the nontraditional student returning to school after many years. Also, many academically advanced students are attending two-year colleges as a transition to the university. The advantage of using current media is that there is a variety of materials available that are inexpensive and appropriate to the level of a particular class.

I am currently teaching a third level writing class, "Reading and Writing about Contemporary Issues," where the required text is a subscription to one of the current news magazines. In addition, the students keep a weekly log showing (1) media broadcasts they watch and hear, (2) newspapers they read, and (3) magazines they read. They are not expected to have long lists of each, but they are expected to read more than just the magazine to which they subscribe. Some go to the library to read, while others pick up additional items at the newsstand. Since some students do not have access to television, they are encouraged to use the library to read additional newspapers and magazines. Those who have access to television are urged to watch shows like *60 Minutes, 48 Hours, Prime Time Live,* and *20/20.* The students keep journals responding to some of the items they read, watch, and hear. They write papers (three essays and a research paper) related to contemporary issues. We do a great deal of discussing in class.

The class is the first time these students have read a newspaper since they were in eighth grade civics. They now find through class discussions that current issues relate to matters that are becoming important to them. We discuss local, state, national, and international issues with a wide variety of students. Sometimes discussions become heated as many students are suddenly exposed to a different point of view. We discuss the terms liberal, conservative, and devil's advocate and some of the syndicated columnists and television news personalities. We strongly encourage the students to examine all sides of issues in order to form their own point of view. While many students do not ever change their basic opinions, they do begin to look at things from a more balanced, reasoned perspective.

We try to help them see how many news events actually impact their lives. For instance, one interesting classroom discussion occurred at the time when the Iron Curtain was collapsing in Eastern Europe. Class opened with the question "What are some of the negative effects that you will feel here in Ohio as a result of the Iron Curtain coming down?" A news release that week announced a large layoff at a tank factory in Ohio as a result of defense cuts based on political changes in Eastern Europe. We discussed the ripple effects felt around the world and specifically in Ohio. This led to a discussion of the effects now facing the local area, including an increase in welfare, plunging property values, an increase in child and spouse abuse, further breakdown of the family, an increase in juvenile delinquency and school dropout rates, and an increase in our taxes. As we discussed these factors, students began to realize that seemingly remote events can ultimately impact their own lives.

By using thought-provoking questions based on current issues that affect us either directly or indirectly, we can reach out to students at all levels and help them develop their thinking, reading, and writing skills. They will establish lifelong habits that will lead to a more informed citizenry involved in a continual learning process. Current media can provide up-to-date, motivating material to help accomplish these goals.